

Historic, Archive Document

Do not assume content reflects current scientific knowledge, policies, or practices.



The Agricultural Student

Horticultural Number

March, 1913

15 Cents per Copy

\$1.00 per Year



The Comfortable Way to Shear Sheep is with this Stewart No. 9 Ball Bearing Machine

With it you can take the wool off evenly, smoothly and quickly. The fiber will be longer; there will be no second cuts in the fleece, and it will bring a better figure in the market. This machine has large balance wheel and gears all enclosed and running in oil. It is fitted with ball bearings throughout, including a ball bearing shearing head. Price, all complete, with 4 sets of cutting knives, is only

\$11.50

Get one from your dealer, or send \$2 and we will ship C. O. D. for balance.

*Write today for new 1912 Catalogue and Free Copyrighted Book,
"EXPERT INSTRUCTIONS ON SHEEP SHEARING."*

Chicago Flexible Shaft Co., 82 La Salle Ave., Chicago

The Best Horse-Power Does Not Always Come from Horses

On the modern, money-making farm, horses divide the work with the gasoline engine. The engine works quicker, better and often cheaper, especially if it is a

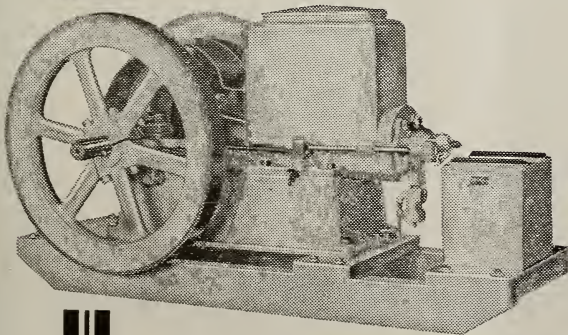
McVicker Gasoline Engine

The McVicker is the simplest gasoline engine made. It has one-third less parts than any other—only four moving parts to the valve action. This simplicity means greater power and less friction. The McVicker actually gives one-sixth more power per gallon of gasoline than any other engine.

The McVicker is essentially a farm engine because it is easy to run, because there are few parts to wear, because it is not only powerful but economical.

Send for Special Engine Catalog

so we can give you full details and prove what we say is so.



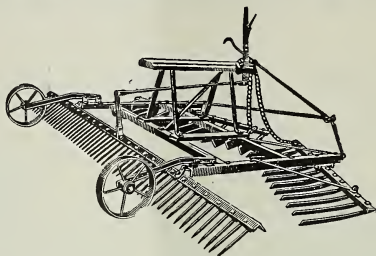
Ask for our General Catalog, too, and see the big Walter A. Wood line of farm implements—implements radically different in construction and with distinct reasons for their superiority.

Write Today.

Walter A. Wood Mowing & Reaping Machine Co.

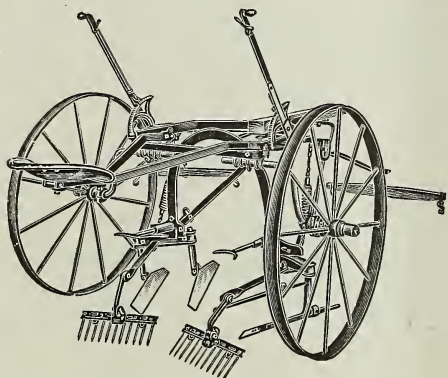
32 Swan St., COLUMBUS, OHIO

The TOWER Pulverizer



Kills more weeds once over than three times with the best harrow ever invented. The United States Department of Agriculture, after a series of tests covering a period of six years, has discovered that weeds are the greatest enemies corn has to contend with.

The Tower Surface Cultivator



cuts the entire surface
of the soil, the same as
a hoe, so that not a
weed escapes.

This cultivator enabled Ivan Houser, a boy of Farmer City, Illinois, to raise the boys' prize acre of corn, 122.6 bushels, and an average of 117 bushels for 7 acres.

Also Chester Yarnell, a 17-year-old boy of St. James, Minn., to win his prize over 1,300 competitors with 102 bushels and 58 pounds.

Write us for their statements as to how they did it.

Be sure your new cultivator has TOWER on the tongue.

The J. D. Tower & Sons Co.

MENDOTA, ILLINOIS.

Wing's 120 Day Yellow Corn Wins State Championship

Dewey Hanes, of Arcanum, Ohio, fourteen years old, wins the one acre plot contest with a yield of 139 bushels 7 lbs.

WING'S QUALITY SEEDS

We handle the very best of FIELD and GARDEN SEEDS. Dodder-free ALFALFA, our own improved strains of CORN and SOY BEANS, MELILOTUS, SPECIAL GRASS MIXTURES for all soils.

Send for our 1913 catalogue and get the latest facts of PERMANENT AGRICULTURE. This booklet contains descriptions of the profitable legumes and their uses in maintaining soil fertility.

THE WING SEED CO.

Box V, MECHANICSBURG, OHIO.

The World Famed Oliver Plows

**ARE MADE WITH SKILL,
SOLD WITH CONFIDENCE
AND USED EVERYWHERE**

As college men you remember how, in early life, you guided and were guided by the Oliver. It would be hard to estimate how many lives have been touched and changed and made right by the happy and fortunate use of the Oliver in early life. Men cling to their associations in life with a surprising tenacity.

You are now training your minds to think and your hands to do better and bigger things. Couple your scientific training with our practical knowledge and your success is assured. To be successful you must know how to do a thing and then have the proper means to accomplish what you believe and know.

Oliver Plows have made good with the farmers because they are made good at the factory.

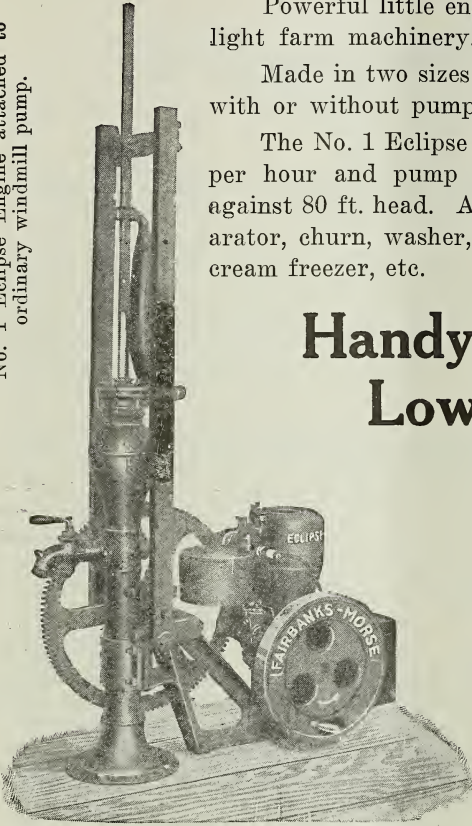
OLIVER CHILLED PLOW WORKS

General Offices at South Bend, Indiana.

Works at South Bend, Ind., and Hamilton, Ont., Canada.

Fairbanks-Morse Eclipse Engines

No. 1 Eclipse Engine attached to ordinary windmill pump.



Powerful little engines for pumping or running light farm machinery.

Made in two sizes: No. 1 and No. 2. Furnished with or without pump jack.

The No. 1 Eclipse will run on a pint of gasoline per hour and pump over 1,000 gallons of water against 80 ft. head. Adapted to running cream separator, churn, washer, corn sheller, grind stone, ice cream freezer, etc.

Handy, Reliable, Low Priced

As simple as it is possible to make a practical, powerful engine. Manufactured in our immense factory on the latest automatic machines.

Large dust-proof bearings. Thorough lubrication. All like parts absolutely interchangeable. Starts easily at any time. No danger from freezing.

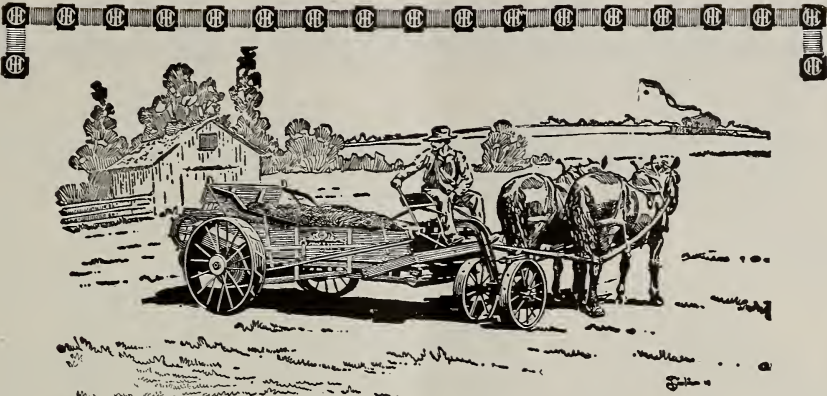
The No. 2 Eclipse Engine is twice as powerful as the No. 1. We recommend it for deep well pumping, wood sawing, feed grinding, etc.

Write us stating quantity of water desired in 24 hours, depth of well and height of lift. We will forward Catalog No. 1890F7 and advise which engine is best adapted to your use.

Fairbanks, Morse & Co.

CINCINNATI CLEVELAND LOUISVILLE CHICAGO

Fairbanks Scales, Oil Traction Engines, Pumps, Water Systems, Electric Light Plants, Electric Motors, Windmills, Feed Grinders, Saw Frames, Spray Outfits.



Land Value More Than Doubled

WHEN Mr. Honeycutt of Lee County, Illinois, bought a run down 400-acre farm about three years ago, some of his neighbors thought he had made a bad bargain.

After three years' soil treatment by scientific methods, he raised more than eighty bushels of corn to the acre on land that produced less than thirty bushels the first year he farmed it.

At forty cents a bushel, that figures about \$32.00 an acre, not less than \$14.00 of which is clear profit, representing 7 per cent on a valuation of \$200 an acre. Mr. Honeycutt paid less than half that price for his land, which is not by any means the best in the state. In all probability it is not as good as the land you are farming. His success is due entirely to his up-to-date, common-sense methods of stock feeding and soil fertilizing. You can do as well or better than he has done, when you begin to supply your soil with the kind and quantity of fertilizer it needs, and spread manure evenly with an

I H C Manure Spreader

I H C Manure Spreaders are made in various styles and sizes to meet any and all conditions. There are low machines and high; steel frames, and wood; wide, medium and narrow machines, all of guaranteed capacity; return and endless aprons; in short, a spreader built to meet your conditions and made to spread manure, straw, lime, or ashes as required.

I H C Spreaders will spread manure evenly on the level, going up hill, or down. The wheel rims are wide and are equipped with Z-shaped lugs, which provide ample tractive power without jarring the machines excessively. The apron moves on large rollers. The

beater drive is positive, but the chain wears only one side. The I H C dealer will show you the most effective machine for your work. Ask to see an I H C manure spreader. You can get catalogues from him, or, if you prefer, write



International Harvester Company of America

(Incorporated) **U S A**
Chicago



Clay, Robinson & Co. Make Money for You

By bringing to bear upon your live stock consignments the best efforts of a selling organization developed and perfected by twenty-six years of constant study and effort.

You cannot possibly find a live stock commission firm of higher commercial and financial standing; that has a better staff of salesmen; or that will work harder to secure top market value for your consignments.

Further, it makes no difference whether you are a small or a large feeder, experienced or inexperienced, we do our very best for you just the same—and that means that no one can do more or better.

*Therefore, to insure utmost Security,
Satisfaction and Profit, you should*

SHIP YOUR STOCK TO

CLAY, ROBINSON & COMPANY

Chicago
Denver

E. Buffalo
So. Omaha

E. St. Louis
Sioux City

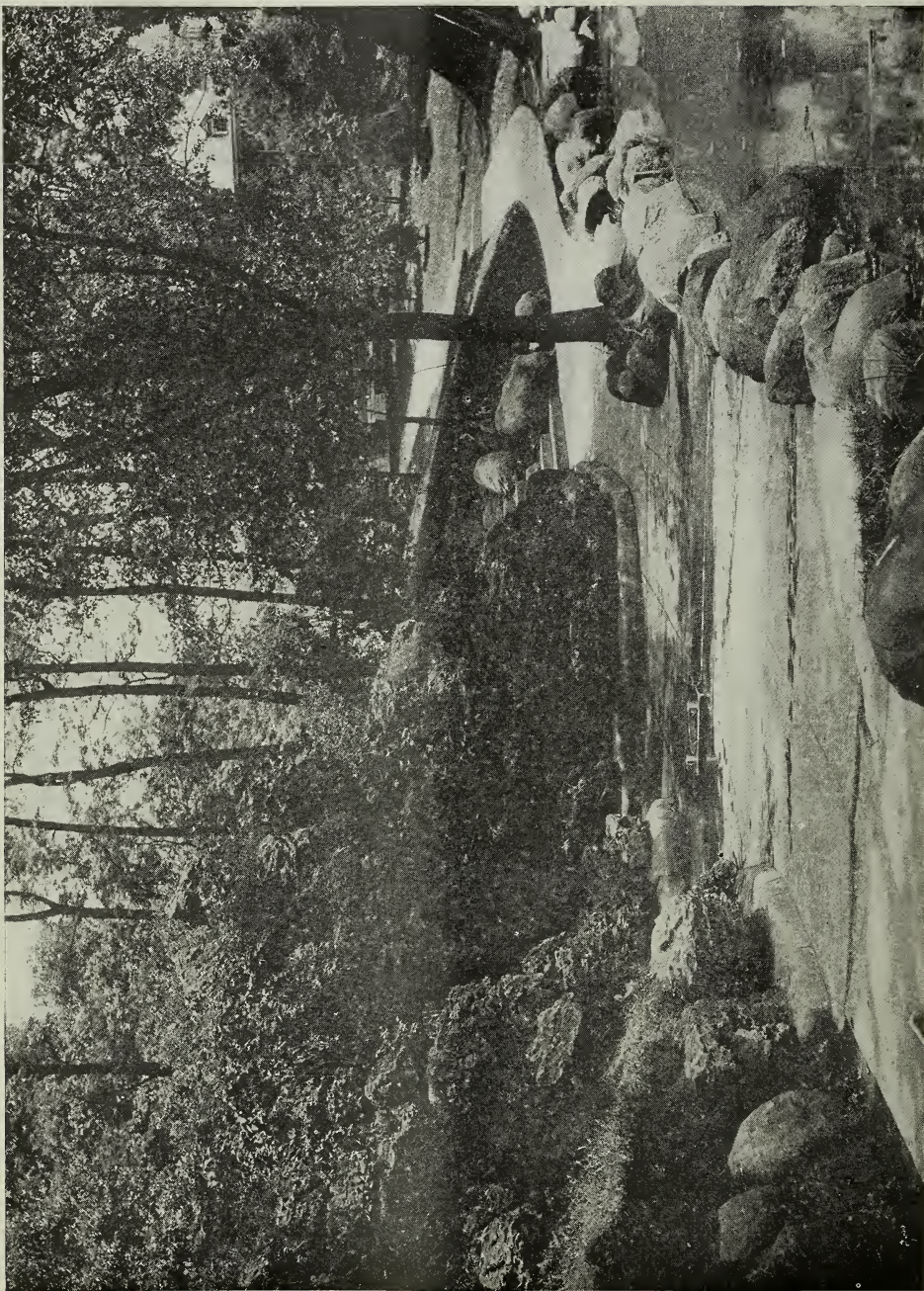
Kansas City
Fort Worth

So. St. Joseph
So. St. Paul



Contents

	Page
COVER PAGE—Photo by Livingston Seed Company.	
FRONTISPIECE—	
MARKETING FRUITS AT THE FARNSWORTH FARMS—	
William E. Young	489
HORTICULTURAL FALLACIES—	
Prof. Wendell Paddock, Ohio State University.....	492
ART IN THE FRUIT PACKAGE—	
J. Upton Gribben	494
DYNAMITE IN THE ORCHARD—	
Gordon Dixon	497
SOME FACTS ABOUT PEDIGREED TREES—	
C. L. Clayton, '13	499
POPULARITY OF TREE-SURGERY—	
Everett Brubaker, '12.....	501
VEGETABLE FORCING IN OHIO—	
C. W. Waid, '98	505
THE NURSERYMEN OF OHIO—	
M. M. Scarff, '14	508
SOME ORCHARDS I HAVE VISITED—	
Robert L. Fleming, '14	511
THE OLD FARM ORCHARD—	
F. G. Charles.....	514
EDITORIAL	516-519
DEPARTMENTS	520-529
NEWS NOTES	530-535



THE AGRICULTURAL STUDENT

Vol. XIX.

OHIO STATE UNIVERSITY, COLUMBUS, MARCH, 1913

Number 7

Marketing Fruits at the Farnsworth Farms

WILLIAM E. YOUNG

IT IS said that fruit well grown is half sold—also some men say that the world owes us a living, but we find it keeps us busy collecting it. So, we sometimes find it very much of a problem, even after we have grown the best fruit possible, to market it successfully and get our full share of the consumer's dollar.

The maketing of fruit is one of the most important of the many details of the business, and yet it is the one, heretofore, the least studied. From force of habit, many men, take the course of least resistance, and this in marketing fruit, is to consign to a commission house, and accept gracefully whatever is returned. Sometimes all you receive is a request to mail a check to cover balance due on freight and cartage. At other times, a grower receives more from the wholesale dealer, than he would have charged a buyer at his own station. However the grower who can sell his products direct to the consumer, grocer or huckster averages much better returns, and is always better satisfied.

Distance from market usually determines the method of marketing. Those at a considerable distance, whose shipments must go by railroad, must pack their fruit in large packages, and make them secure against rough handling and dishonest handlers. Those located near their markets, so that the fruit can be hauled by wagon or auto truck, or

shipped by electric freight or express, may use a smaller package and cater to a select trade.

But whatever the package, care should be taken to put into it only fruit of one grade, and to have the grade uniform throughout. Each package should contain besides the fruit, the name and address of the grower. It is well to use a farm name or trade mark, or both, and to make it represent a standard of excellence. Consumers will soon come to look for this name, and be willing to pay a little extra for the fruit accompanying it.

Almost all articles of food can now be found in our stores, packed in individual packages and labeled with the brand and name of the producer. Why not the same with fresh fruit? Perhaps the methods of marketing employed at our Clover Leaf Fruit Farm, Waterville, Lucas Co., Ohio, will be of interest.

The first fruit of the season to be marketed is the strawberry. During the berry season we pick from 50 to 100 bushels daily. These are shipped by electric freight to grocers along the line. Before each season opens, the writer plans to personally call upon the grocers of these towns and secure their orders for a daily supply. After these orders have been filled, if any berries remain, they are consigned to commission houses in Lima, Springfield, Dayton, Columbus, or Toledo, according to

market conditions. The long distance phone is freely used at this time.

After the berries, we have cherries and currants. A year ago we picked and sold 1018 bushels of cherries from a $3\frac{1}{2}$ acre orchard and secured an average of \$2.20 per bu. for the crop. At this time there was an abundant cherry crop, and many sold the fruit for \$1.00 per bu. or less.

Because our fruit is known to be strictly first class, free from imperfections, and honestly packed, the top prices are secured. Prices on cherries are usually from \$3.00 to \$4.00 per bushel.

Last season we marketed 1390 bushels of plums and secured an average of \$1.87 per bushel. Our nearby towns do not buy liberally of plums, so most of the crop was consigned to commission houses in Detroit, Springfield, Dayton and Columbus, with very satisfactory returns. The fruit was packed in bushel baskets, and reached the markets in good condition.

We had no peaches last season, our first failure in sixteen years. During the season of 1911 we marketed 6000 bushels of this fruit. Beginning about Aug. 15th the Ohio Electric Ry. puts at our disposal one of their best freight cars, one with a splendid set of springs. We shelve this car on both sides, leaving an aisle through the center. No baskets are ever stacked on the others, and no fruit is ever bruised. It reaches our customers in perfect condition. The car is loaded daily with peaches, plums and pears, and at 6:30 each evening is made a trailer to the regular freight car, and with some one as distributor, it starts toward Lima. The different orders are assembled enroute, the name of the grocer is stamped on the handles of the baskets, and invoices attached. Stops are made at all towns

where the orders are put into the freight rooms to await the grocers early in the morning.

Lima is reached about midnight. After supplying the trade there, should any fruit remain, it is sent on to Springfield, Dayton or Columbus, and arrives early the next morning. The many advantages of being located near a good electric line is readily apparent. We have used this method of marketing our peaches for four years, and believe the service could hardly be improved upon. It gives us a full day in which to pick and pack; the fruit is traveling at night while it is cool; it is in the grocers hands early the next morning; and usually the consumer has it in less than 24 hours from time of picking.

We are thus enabled to let the fruit remain on the trees until mature. It is then higher colored, and better flavored and far surpasses, in quality, the fruit picked while green and hard, and shipped long distances in refrigerator cars.

Just at present, the apples are being marketed. When our apples are first picked they are emptied into bushel crates, and immediately stored in the cold storage house on the farm. This building is cooled by means of ice stored in an ice chamber directly above the apple room. Eight inch galvanized iron pipes lead from near the ceiling of the apple room to the top of the ice chamber. The warmer air from the apple room is permitted to go up to the ice chamber, where it is cooled and descends again to the apple room. Here the operation is repeated and a constant circulation is thus kept up. The building is well insulated by having several walls with dead air space between. All through the fall and winter the temperature in this room remains about 35 degrees. The apples

are sorted, graded and packed as orders are received. All fruit is sent out the same day as packed. Thus no spoiled fruit is ever delivered to a customer, and when packed in small packages, none are bruised, as is always the case when barreled or boxed.

Our best grades of apples are packed in standing handle market baskets, holding about one half bushel. A printed slip, containing our distinctive trade mark, farm name, and address, is placed on top of the apples, and the

we ship weekly or semi-weekly, 25 to 50 baskets, as per their phone orders. We set our own price, which is always in advance of the regular market price of barreled stock. But these basket apples are perfect specimens, honestly graded and carefully packed and labeled, and delivered free from bruises, and fresh from the storage. It is high grade service and commands the highest price, and the best feature of it is, that everyone is satisfied—the grower, grocer and the consumer, the only



This car makes daily trips from Waterville to Lima and return, from August 15 to November 1, hauling Peaches, Pears, Plums and early Apples.

basket covered with red netting, carefully tucked under the rim by a knife. This makes a very neat, attractive package, convenient to pack; ship by electric freight; for the grocer to display and sell, and for the consumer to buy and carry home. It is just about the quantity that the average family desires to purchase at a time. We have some six or eight grocers in Toledo, 15 miles distant, who cater to the best trade, and demand high quality products to satisfy this trade and to these

persons interested. This is about as near to the consumer as the large commercial grower can hope to come. We fill many private orders, but the bulk of the crop goes direct to the grocers.

As it is impossible to grow all perfect, fancy specimens, we have a second grade to dispose of also. Some of these are barreled and sold to grocers who want moderate priced apples. The balance of them, together with the apples of inferior quality, such as Ben Davis, Stark, etc., are usually sold to

a huckster who drives out from Toledo and hauls about 40 bushels at a load. Apples which are slightly spotted or imperfect, can be sold locally to good advantage. Thus we find a profitable market for all grades, from cider stock to the extra fancy. At present we get 25c per bu. for the culls and \$2.00 per bu. for selected Jonathan, Sutton's Beauty, Winter Banana, etc.

With so many excellent markets at their very doors, fruit growers of Ohio have every advantage possible over their heretofore much envied Western friends, and if they will but take greater care in producing high grade fruit, and learn to pack it honestly and attractively, the problem of marketing will not be as complex for them, as it is for the growers located in the great fruit sections of the West.

Horticultural Fallacies

PROF. WENDELL PADDOCK

Horticultural Department, Ohio State University

THERE is probably no part of orcharding that is less understood than is pruning. Probably the majority of people who think of the subject believe in very light pruning, and as a result their trees usually become thick and tall with age. Such trees usually produce small fruit and much of it is borne too far above ground to be reached satisfactorily either by sprays or by picking ladders. Now that increased interest is being taken in orchard rejuvenation, many men do not hesitate to cut back these large limbs. And this is the proper thing to do under such circumstance, but that this procedure will shorten the lives of many trees cannot be doubted, particularly if the pruning is done by unskillful men.

It is not our purpose to discuss the details of pruning here, but to point out that simply from the nature of things any fruit tree will produce a surplus of branches and when growing in good ground most fruit trees will eventually become too tall.

All will admit that large branches should not be removed from trees if it can be avoided, so why is it not a much more rational plan to train and prune

a tree while it is young. Growth is active at this time and the wounds made in pruning soon heal. Then if the training be followed by systematic annual pruning, trees may be kept in shape and the necessity for removing large branches will seldom occur.

This is the season of the year when the tree agent runs rampart through the land. He is often a good, reliable fellow, but occasionally one appears whose statements may be taken with a grain of salt. All too often we hear of men who have paid a dollar apiece for trees that were said to be grafted on whole roots, or on French crab stock, or the variety is said to be a hardy one of the standard kinds, and so on.

Trees of standard varieties grown by reliable nurserymen are nearly uniform in price the country over, so the appeal for extra prices should always be looked upon with suspicion.

We may be prejudiced in favor of whole root, piece root, or budded trees as the case may be, but after all it makes but little difference how a tree is propagated so long as a good tree results.

The so-called French crab stock are good and so are American grown

stocks, but the question of hardy stocks need not be considered in Ohio. Hardy forms of well known varieties would be desirable in some instances if they existed, but for the most part they are yet to be produced. We recently visited a 5 acre peach orchard which was planted to so-called hardy Elbertas, Crawford's, and so on. The term "hardy" in this case was, no doubt, supposed to apply to the power of the trees to escape injury by late spring frosts. This would certainly be a desirable quality in a peach tree and would be an appealing selling point. Some peach trees are hardier than others, but the hardy forms of particular varieties have not as yet made their appearance.

Patent tree washes and dopes make their appearance each spring and catch many people, especially those who are looking for some plan whereby they may escape the hard work of spraying. These preparations are usually to be applied in some easy fashion either on

the ground around trees or to their trunks. The trees are supposed to absorb the material and death is said to be swift and certain to all insects, as well as to the rots and blights that infest orchards.

That such a universal remedy, so cheaply applied would be a great boom to fruit growers, goes without saying. This is a scheme that some of our best scientists have studied, but thus far no progress has been made. If such a remedy is ever found it will attract as much attention as the new cure for tuberculosis, and we may be sure that it will have the sanction of the best authorities.

It is always a wise plan to consult with the experiment station workers before investing in horticultural schemes of any kind. These men, because of the nature of their work, and usually in a position to know the worth of any article that may be used in fruit growing.



Art in the Fruit Package

J. UPTON GRIBBEN

MUCH time and careful study has been devoted to the preparation of practical articles dealing largely with planning and laying out of the orchard, kinds of soil best adapted to the different varieties, selecting of trees, planting, pruning, spraying and many other subjects bearing on the different phases of fruit culture, that the progressive fruit grower may better comprehend the many problems which confront him in his efforts to grow better fruit.

Many of our orchardists have given heed to such instructions and are making rapid advancement in bettering the fruit conditions of Ohio, and it is these, whose ambition is to produce only the best, whom I wish to address most particularly. I hope, however, that all may find sufficient interest in this brief article to enable them to understand more fully and in a more or less comprehensive way some phases of the packing question, that they may be encouraged in their efforts to produce the best and more of it, and also that the consumer may be more particular in his views on this question and select from the better grades of fruit.

After we have grown the fruit, the next and very important part is picking, grading, packing and marketing. Of these I wish to call particular attention to the packing, and to encourage most of all, a display of the artistic in this part of the work.

No one thing has more effect on the output of a farm, or tends better to bring the grower before the consumer, than the manner in which the fruit is graded and packed.

Just why any fruit package, other than the barrel, and more especially

the artistic box package, has not received more serious attention in our Ohio markets is a little difficult to say. Numerous reasons have been advanced, and there are those who will tell you that they sell through the commission man and that he prefers the barrel to the box. This does not seem reasonable, for many of the commission firms sort over the barrel, selecting out the best, which are then packed in boxes and sold at a higher price than the barrel would command.

If there is a preference for the barrel, then there must be something wrong and I think you will find it in the fact that there is usually no system and very little care displayed in packing the box. "Any old box pack won't go," and unless you intend to adhere to the best you might just as well not try, for you only court failure if you do. You can't pack apples in a soap box and expect to win, nor can you make a box out of barn boards and expect it to be neat in appearance. These are the real conditions for making the box pack unprofitable in Ohio, and no commission man wants to take chances on packages of that nature. Many have a mistaken idea about the use of the box, looking upon it as a secondary form of package to the barrel and not requiring any more care in its packing. This, however, is a wrong idea, for the box is of greater importance than the barrel and an indication of advancement in the fruit industry, and should never be disgraced by haphazard filling—I use the word filling because it applies to the methods sometimes used, while the word packing carries with it an indication of care, and produces a box that you need not be ashamed of when

placed alongside of the other fellow's.

Some have said that it takes an artist to pack fruit for the fancy trade and that there are few people who really can do it. It may be true to some extent that some men are born artists, but this should not discourage anyone from trying to improve his own conditions, and I firmly believe that that person does not live who has not some sense of

world alongside of California, Oregon, Washington and other Western States, we must improve on our present style of packing, and one of the first steps necessary to this improvement is to grow a higher per cent of choice fruit.

In the present style of packing in the West and with all their very excellent packages, there is still room for improvement in the general make-up of



WELL PACKED, HALF SOLD.

appreciation of art in his soul, and he owes it to himself to develop every particle of artistic taste there is in him if he expects to find a place in the front ranks of the fruit growers, for there is a sort of discontent among growers of the present day which is sure to develop into better things. We should encourage it in every way possible, for without this discontent with existing conditions there would be no progress. If Ohio is to occupy a place in the fruit

their packages, and if Ohio growers wish to excel it is possible to do so by care and artistic taste in packing.

Unlike the West, we have not established large shipping centers to which the fruit is sent for sorting and packing, which is largely responsible for their present methods and success. Most of the fruit sections of Ohio are limited in size and most too widely scattered to carry on a very extensive shipping association. On account of these limit-

ing conditions, we should not become discouraged when we see the rapid advancement made by the West, for I see in our conditions greater possibilities for establishing an individual reputation than most associations offer. I do not mean by this that the grower remains unknown when shipping through the association; in some cases this is true to a degree, but not in all, nor do I wish to be understood as taking sides against the co-operative systems, but rather in favor of such, for the advantages to be gained are too numerous to be considered at this time.

In Ohio we have to deal more nearly with the individual problem, and it is the personal methods which you practice on your own farm which I wish to dwell upon, and if it is your desire to improve these methods, I hope you will get from this some suggestion which will awaken in you a desire for better things.

Of course all fruit grown can not be of the highest grade, and this variation has naturally brought about a demand for several grades. There is the extra fancy grade which is demanded by the well-to-do. Then the No. 1 and No. 2 and possibly a No. 3 grade for those less particular or who cannot afford the fine grade, then the grade for canning factories and the cider mills. These several grades should be carefully selected and packed in packages suitable to the grade and purpose for which they are intended.

All extra choice and the best No. 1's should always be packed in the box or fancy basket, and in the most attractive manner possible. These should be selected for uniformity in size, color and be free from blemish of any sort.

Nos. 1's and 2's should be packed carefully and neatly in barrels or baskets. The other grades in barrels or

any other convenient form of container which tends to improve their appearance.

The box is used almost exclusively on the Pacific Coast and the Northwest and for several reasons is preferable to the barrel. It is better suited to the retail trade, as a small consumer can better afford to buy when in packages smaller than the barrel. It is more convenient in handling and occupies less space in shipping and carries with it the idea of a fine quality. Another advantage it has over the barrel is that it can be made more attractive by the use of display labels, which are very important. As they can be registered and protected as trademarks, these should bear the name of the variety and the name and address of the grower. Then, if honest work is done in grading and packing, the grower will soon gain a reputation as a producer of the best and, when his trademark is seen on the market, the producer knows at once what to expect when the package is opened.

To give you some of the possibilities in packing, I have prepared a few specimen packages, using in the work boxes which represent the sizes used in various parts of the country. These boxes, with the exception of the two small ones at the top of the illustration, all hold more than the standard bushel. The square boxes are used extensively in the East, particularly in New England; the oblong boxes represent the Western type. In addition to the bushel box I would recommend the half box. While such a box is not in use, I believe there is a good field for this small package.

In the system of box packing there should be a standard box, applicable to the entire country, in order that the consumer may be assured of the qual-

ity contained therein, for when a market displays boxes which vary in size and shape, as is the practice in the East, the purchaser would naturally be confused, and for this reason we should strive for a uniform standard. It removes any possibility of doubt, and

a box of standard size for the United States would greatly benefit the entire fruit industry. It is our duty to become interested in it, as we should in all things which tend to improve the conditions of fruit marketing and help to bring about a higher degree of art in packing.

Dynamite in the Orchard

GORDON DIXON

SCIENTIFIC horticulture stops short of no expedient. If in the long list of inventions or discoveries any agency presents itself which may be adapted to the needs of the fruit grower its development at once begins. The use of dynamite in orcharding is a point in fact. From a lowly beginning ten or

Dynamite may be said to have three fields of usefulness to the orchardist. The first is in setting out young stock, especially in heavy soil. After fixing the exact spot where a new tree is to stand, by lining up a stake with the row, the stake is removed and a hole is punched twenty-four inches deep



TWO-YEAR-OLD CHERRY SET IN SPADED HOLE.



SAME KIND OF TREE SET IN DYNAMITED HOLE.

fifteen years ago when it was first used in California to save time in setting out trees on heavy soils it has spread to a greater or less degree all thru the orchard districts of the East. In the famous Hale peach orchards of Georgia it is quite extensively used.

with a crow-bar (a dirt auger is ineffective in shaly or clay sub-soils). The hole is shot with a half stick of dynamite. A handful of ground bone and a little nitrate of soda may be dropped into the opening and covered with a shovelful of top-soil. The tree

is planted and tamped in the usual manner, not forgetting to leave a dirt or straw mulch on the surface. This method of setting young trees presents several advantages over the spade-dug-hole system. The saving of time and labor is important, but in addition the hard ground is cracked for many feet downward and sideways, these cracks acting at once as easy paths for root growth and as reservoirs to hold excess water until the droughts of sum-

mer. The ultimate effect is that such trees reach maturity and bear fruit one to two years earlier than normally. The second use for this handy explosive agency is in removing dead trees. Their death is very often due to grubs, rot, or other root diseases which have either been the direct cause or have so lowered the vitality of the plant as to make it an easy prey to infection. It has been our experience that a rest of two years is necessary for these troubles to die out. Dynamite not only removes the main trunk but the prin-

cipal lateral roots as well, fining the soil and, by the fumes being left a short time, disinfecting the earth as well. The procedure is to burrow under a large root close to the trunk, or the trunk itself, if possible, and place a flat stone so as to direct the force of the explosion upwards. Tamp in and shoot. The size of charge naturally depends upon the size of the tree.

Perhaps the last and generally least important use of dynamite on fruit



DYNAMITE AND SPADE-SET TREES UNDER SAME SOIL AND CLIMATIC CONDITIONS.

mer. The ultimate effect is that such trees reach maturity and bear fruit one to two years earlier than normally.

The second use for this handy explosive agency is in removing dead trees. Their death is very often due to grubs, rot, or other root diseases which have either been the direct cause or have so lowered the vitality of the plant as to make it an easy prey to infection. It has been our experience that a rest of two years is necessary for these troubles to die out. Dynamite not only removes the main trunk but the prin-

plantations is in rejuvenating old, run-down orchards. The size, distance of separation of the trees and amount of acceleration of growth desired governs the quantity of slow acting dynamite to be used. A charge is used in the space-rows opposite each tree and perhaps three feet deep. This treatment cracks and fines the soil in every direction, but of course the principal cracking and water reservoir comes half way between each tree so that the roots are directly encouraged to spread out toward this new pasture. In old

apple orchards it generally pays to winter-prune very heavily so that practically a new top is formed on the trees by the first year's growth; the second year is then entered upon with a young top having a clean bill of health and a wide, vigorous root system.

Aside from the cost, which is not excessive, there seems to be but one ob-

jection to the use of dynamite. It is the danger of inducing so vigorous a growth the first year that the trees may not go into the winter with their wood properly ripened and matured. This difficulty may be controlled to a considerable extent, however, by the judicious use of early fall cover crops and the sod mulch.

Some Facts About Pedigreed Trees

C. L. CLAYTON, '13

THE subject of pedigreed nursery stock, especially as applied to fruit trees, has become of much importance to fruit growers, nurserymen and all interested in horticulture. If the statements and claims made by some nurserymen are true, the fruit grower should know it, and on the other hand if they are without foundation, this knowledge will save our growers from much disappointment and often from paying excessive prices for such stock. If it is a fact that varieties of fruit can be improved by selection of buds, scions and cuttings in propagation, this knowledge would revolutionize the common nursery practices.

At this time pedigreed seeds and plants are very common, and it may be truly said that we can tell as much from the pedigree of a plant as from that of an animal. However, the pedigreed tree idea endeavors to attach importance to the pedigree of plants grown from bud, scions, etc. We must carefully distinguish between plants grown from seeds and those grown from cuttings, buds, etc. Seeds carry the characteristics of the two parents in various combinations. Thus the individual seedlings vary. A bud or graft, however, is literally a part of the original tree of that variety. Thus a

graft of any tree of a variety is the same as a graft from any other tree, and should give the same results under the same conditions. In making this statement we must consider that a few of the commonly considered varieties include several different strains. Thus in the case of Greening we have a yellow and a green strain. In propagating such strains are considered as varieties.

It is now considered that nearly all of the variation in productiveness, color of fruit, etc., of fruit trees is due to environmental conditions. Such differences are not transmitted from parents to offsprings, and thus selection with them is of no avail. The trees which have the better location, richer soil, more sunlight, better care and fewer insects or diseases are more vigorous, produce more fruit, and the fruit is larger and more perfect. So we see that the outside conditions produce effects on the plant during its lifetime, but such effects are not inherited by the offspring. The fruit grower, to produce the same results, must renew for each generation the conditions which gave the desired results.

The other kind of variations and the only kind which is now considered to be of any value in propagating, is what are termed sports, or mutations. These

are variations which are hereditary from parent to offspring. Trees having special vigor, hardiness, color of fruit, etc., may occur as mutations. However, these mutations are so rare that the chance that some of the "pedigreed" stock has been propagated from such a tree is negligible. In other words, the chances are very small that stock grown from specially selected scions will inherit the special characteristics of the tree from which the scion was taken. If it were possible to grow the young trees under the same conditions of soil, water supply, etc., as the mother tree, we might expect approximately the same results. This would not be due to heredity, but to the similarity of the outside conditions. Any two ordinary trees of a variety, grown under the same conditions, should give the same results, and it is the fact that practically no two trees in the orchard are ever under the same conditions that gives us the difference in individual trees. Thus we see how trees sent out from a nursery, and planted under widely different conditions, could not be expected to give the same results as the trees from which the scions were taken.

No man can tell by looking at a tree whether it is a sport or simply a variation due to environment. The only way to decide is to propagate and see if it comes true to the original type. For

as we have said, mutations are inherited and variations due to environment are not. It is by these occasional sports that our varieties are improved and new ones formed.

To show the effects of outside conditions, we may consider the case of the Spy in Northern Michigan. Here the soil and climate are not adapted to this variety and the apples are poor and almost worthless. Now if we were to plant here a tree propagated from a good tree in some other region we would not expect to get good apples. In fact we know the fruit would be the same small, worthless apples as on the other tree. Thus it is the environment that influences the tree. The fact that the nursery tree was propagated from some extra good trees in another region had no influence on the fruit in Northern Michigan. Probably scions from any Spy tree would give the same results.

From the above statement it should be plain that the fruit grower will probably get the same results from planting ordinary nursery stock as from any pedigreed trees, the stock being of the same general health and size in both cases. In fact, it is possible that ordinary stock would give somewhat better results for the first few years, as in pedigreed trees the scions are taken from bearing trees and this often gives a tree somewhat lacking in vigor for several years.



Popularity of Tree-Surgery

EVERETT BRUBAKER, '12

THOUSANDS of people travel thru our cities today and visit their parks, pass thru the shaded streets of their residence districts and admire the large beautiful forest trees which add to the beauty of the street and to the

house before I could reap any benefit from it?

If some real estate firm had lots for sale, these being priced to you the same, and on a few of them were several large trees, which lots would you buy?



THE LOGAN ELM.

Historic Trees are Priceless—Their Lives Should Be Prolonged at Any Cost.

comfort of its citizens,—but few of these people even stop to consider how long it took those great trees to grow into such beauty and symmetry. They never ask themselves the question,—how long would I have to wait if I planted a tree like this in front of my

Certainly you would purchase those particular lots on which the trees grew. Then you would always be at an advantage over your neighbor who would have to wait a life time to get what you already had. Why then should you not be willing to spend a few dol-

lars to repair some decayed places in these trees which add so much beauty and comfort to your home?

The Park Commissioners of our cities today are waking up to the fact that the preservation of their forest trees is a great movement toward the betterment of their parks and playgrounds and are providing for this by asking for appropriations to pay expert surgeons to care for them. Thru these movements tree-surgery has today gained a wide popularity which has come to stay, not only in the East but is spreading fast in the western cities as well as in the different sections of the country.

Fifty years ago the woodman did not realize the great waste when he felled the large forest tree just to burn in order to make his cornfield larger and would have gasped in astonishment if some one should have told him that his grand son would be paying some expert sixty cents an hour to treat a tree in his front yard or along his driveway. But this we find to be quite true and they are glad to have them treated at that price, as they realize that it would take another generation to replace such large specimens.

Some Reasons to Condemn Cement for Tree-Surgery.

There are many tree-surgeons who use cement, but few have used it successfully. In all tree surgery the first thing that is done is to remove all decayed material from the cavity, then cleanse with some strong insecticide and fungicide to destroy the remaining spores. After this the cement is placed in the cavity in such a way as not to fall out till it is set properly. But here is where we find the great criticism with cement. It is almost, and in some cases, absolutely impossible to get the cement to adhere to the wood after it

sets. In many cases the mouth of the cavity is in such a position, that it will catch some water and moisture. Then after the moisture is between the cement and the wood, it affords a very appropriate place for the growth of spores and mycelium which will again induce decaying of the wood. Furthermore, after the water once gets behind the cement, the freezing and thawing will cause expansion and contraction. This will force the cement to crack and fall out so your money and efforts are lost. Therefore, in my opinion, other methods should be practiced in sealing the cavity.

The Asphalt Method.

This method has been practiced only a few years and by only a few surgeons, but has given very satisfactory results. It has been used to some extent in Columbus, Cleveland, Cincinnati, and other small towns of Ohio. The trees are now being treated with the asphalt method under the direction of W. R. Munger, expert tree-surgeon of Columbus, Ohio.

The first step in this method is the same as when treated with cement. After the decayed wood has been thoroughly removed and the cavity cleansed with some fungicide, the next step, is to counter-sink around the edge of the cavity about three-fourth of an inch in width and one-fourth of an inch below the cambium layer or the growing part of the wood. In turn comes a very important stage of the operation, which is the fitting and nailing of the zinc over the cavity. Zinc is always preferred to tin as it does not rust so readily. Short roofing nails are best to use. On top of the zinc is nailed a piece of hard-ware cloth, the purpose of which is to reinforce and assist in holding the asphalt when applied. The final step is the application of the asphalt.

This asphalt is used for tree work only and looks similar to the asphalt used on the streets, but is prepared from an entirely different formula, which makes it air and water tight.

The asphalt requires a high heat to prepare it for application. A convenient way of heating is to use a large gas or gasoline burner. As soon as the asphalt becomes thin enough it is applied with a stick, on the end of which a piece of cloth is securely tied. A brush would be more convenient to use, but will soon burn. The asphalt holds heat for quite a while and gives the surgeon plenty of time to complete the operation at one heating. After it has cooled the edges can be smoothed with a chisel. This renders the cavity, water and air tight and in a year or two the cambium layer will grow over the zinc and asphalt, making the cavity still more secure from air and water. Another very important point in favor of the asphalt is the fact that it is not susceptible to heat and cold, which prevents it from cracking and falling, from the effect of expansion and contraction.

What Starts a Tree to Decay.

If people would observe closely and ask themselves a few questions, it would not be difficult for them to trace the reasons for decayed places in trees. The preliminary causes for the decayed wood in trees are usually as follows: First, injury to the cambium layer by mechanical means, second,—improper pruning and care after pruning, third—thru improper growth of trees, for example limbs growing too close, cause the bark to be injured when swaying about by the wind. Also trees form rather deep pockets in their forks, which catch much water and dirt, in time causing the heart-wood to decay, leaving the tree hollow in a few years.

Fourth, no treatment to branches after being broken off by windstorms. Just as soon as a tree is affected by any of the above preliminary causes, it leaves an excellent opportunity for the growth of spores and mycelium, which directly causes the wood to decay. Much of this could be prevented by proper treatment of the preliminary causes named.

Average Cost of Tree-Surgery a Cent a Minute.

Is a cent a minute too much money for the people to pay the tree-surgeon? If those who think so would investigate the various difficulties and hardships of the profession, they certainly would say it was not enough. In proportion to what a specialist would charge you for an operation on your nose or eyes, it is but a small sum. This sort of surgeon will charge you fifty dollars to operate on your nose, but it only takes him one or two hours to perform the operation. Certainly we do not value our trees as much as we do our eyes and noses, but the expert tree-surgeon who has spent four years in college and as many years learning the practical side of the work, surely deserves more than six dollars a day for his efforts.

Another important fact which people do not realize is that a tree-surgeon can not get his labor for less than \$2.00 or \$3.00 per day. Men take great risks working on forest trees, in which they have to climb from forty to sixty feet from the ground and then sit in a rope swing while they treat a cavity. After deducting his own wage and the cost of the material, the tree-surgeon has little profit to spend on his advertisements and keep up his profession.

The writer is heartily in sympathy with the article which Mr. G. H. Coons published in the Country Gentleman, Jan. 4th, 1913, about "The Apple-Tree-

Surgeon." He mentions the importance of learning the trade for home use in the orchard, in order to cut the higher prices he would have to pay the expert. But it is not true that there are few men who could learn this profession unless they had at least a season's experience? Here is the one great trouble today; there are too many amateurs in the business. They treat trees for people and do the work for a little less than the expert would, but later the work proves unsatisfactory, then when the expert tries to get practice in this community, he finds his troubles.

Without a doubt, the value in the proper care of fruit trees should be impress more strongly upon the minds of our fruit growers today. While tree-surgery is not as popular in our orchards as it is with the shade trees in the cities, in all probability it will be just as important commercially, or even to

a greater extent than with the forest trees. It has been tried out successfully on the abandoned orchards in the East. Horticulturists realize that an apple tree 25 years old and of good variety, will probably produce from 20 to 25 bushels of apples annually if given the proper care. Also they realize that an expense of \$5.00 to \$10.00 per tree is a good investment toward putting this tree in good bearing condition. With this expense they can prolong the life of an apple tree ten or more years and at the same time make it produce double the amount of perfect fruit. Most of this expense goes toward the use of the saw and chisel.

Thus it seems that tree-surgery should grow more popular, both in our orchards and in our cities. It protects the fruit grower as much as the city resident who needs the comforts and beauty of the maple, elms and oaks.



Vegetable Forcing in Ohio

C. W. WAID

OHIO is one of the foremost states in the union so far as vegetable forcing under glass is concerned. Some of the largest and most up to date greenhouse establishments are located within the borders of the state. The total area under glass which is devoted to vegetables in Ohio has been estimated at from 125 to 150 acres. The largest set of greenhouses which is under one roof covers about 10 acres.

The increase in the area under glass has been very rapid during the last 10 or 15 years. While I have no figures to go by it is my opinion that there is at least 3 or 4 times as much glass in Ohio today as there was 15 years ago. The tendency has been for large growers to add large additions every year or every few years and in some cases the amount of glass has been doubled in a single season. This rapid development has occurred more especially at Ashtabula, Toledo and Cleveland although a few large greenhouse plants have been erected at other points over the state. The fact that the greatest development along this line has occurred in the northern part of the state has led to a somewhat uneven distribution of the product. At certain times some markets in Northern Ohio are overstocked with lettuce, while some of the cities in Southern Ohio are not well supplied with this commodity. Greenhouse grown vegetables are somewhat of a luxury and for that reason are among the first products to feel a business depression. The supply of southern grown lettuce, tomatoes or cucumbers which are offered on northern markets also has a great influence on the prices of these crops as grown in greenhouses. Some growers feel that the supply of

lettuce especially has exceeded the demand. This would seem to be the case so far as the fall crop is concerned especially in those markets nearest the large producing centers. It is my opinion, however, that there is still room for the development of this industry in this state. I think it would be unwise to continue to rapidly increase the area in the large producing centers unless a change in the plan of cropping is brought about. Lettuce is an easy crop to grow as compared with some other forcing crops and the growers will not devote space to other crops so long as lettuce can be made to pay. "Necessity is the Mother of Invention" and it would seem that the time has come for growers to pay more attention to other crops than lettuce for the fall crop at least.

It is true that some have grown tomatoes, a few cucumbers, and others, chrysanthemums for the period up to and including the holidays. There is no question but that the area devoted to these crops at that time of the year will be increased another season. Beets, radishes, some form of greens, string beans and culiflower are some of the crops which could be substituted for lettuce and would pay better than lettuce at 3 cents which was the price received by many growers for several weeks last fall.

Another unfortunate practice which needs to be given more attention by the growers is the custom with retailers of keeping the retail prices up no matter what the wholesale price may be. Many consumers had to pay 15 cents per pound for lettuce last fall for which the growers received 3 cents. There is nothing dishonest about this practice

and no doubt it would be hard to persuade the retailer that it would be better for all concerned if he would sell lettuce for a less margin of profit and in that way increase consumption. In many cases the retailers losses are heavy and in most cases they would rather make 5 cents selling one pound than two. Their investment would not be as large nor their danger of loss from spoiled lettuce as great when handling one barrel as two of the same quality and pack. I do not know how this problem can be met except by educating the public to ask for lower prices when the wholesale price will warrant. The wholesale price might be given the buying public through the press if the growers would see that it is probably done. It is not unlikely that Parcels Post may have some bearing on this question when people get accustomed to make use of it.

There are a number of smaller sized cities and a few quite large cities in the southern half of Ohio which are not well supplied with greenhouse vegetables and which would consume a very much larger quantity of these products if they could get them well grown, neatly put up and fresh. A grower who knows how to grow good stuff and how to put it on the market can furnish most of the greenhouse products used by his home town if he has them in sufficient quantity and so arranged as to time of maturing as to supply the market at all times. He can not only hold the trade but can also get a better price than an outsider as his products will be fresher than shipped stuff and most dealers are glad to favor local growers if they do not have to sacrifice much in a financial way.

The use of a small greenhouse run in connection with a market garden has

not received as much attention as it deserves. Hotbeds and cold frames have been used more or less by nearly all market gardeners but greenhouses have been run by a very small per cent of the gardeners. The first cost has no doubt kept many from building greenhouses and possibly the necessity of night firing may have influenced some against such a plan. In so far as the cost governs the activity in this line a small greenhouse if located near a retail market will soon pay for itself. Many gardeners have idle time during the winter months and a greenhouse will furnish not only profitable but pleasant work as well. A person who has always been accustomed to starting his tomato and other plants for outdoor crops in a hotbed or cold frame does not realize how much superior and better in every way a greenhouse is for that purpose, until he has had a chance to try it.

Few people realize what can be secured in the way of returns from a small area under glass. When an average price of 10 cents per pound can be secured for lettuce and tomatoes a good grower should be able to realize 40 cents gross per square foot of bed or bench space by growing three crops of lettuce, followed by one of tomatoes. This amount would apply equally as well if cucumbers were grown instead of tomatoes. From this it can be shown that a house 100 feet long and wide enough to permit of two 6-foot beds or benches would give a gross return of \$480 per year.

The heating of such a house would not require as much night work as some may think, if a good hot water system of heating is put in. One firing at 9 or 10 o'clock in the evening would be sufficient when the temperature does not fall below 25 to 28 above zero.

Where the temperature drops to 15 to 18 above a second will be needed at one or two in the morning. When the temperature is around zero the fire should be built at least every 3 hours and if it is windy even oftener. There are only a comparatively few nights during an Ohio winter when a person cannot get a fair night's rest and do the firing of the greenhouse boiler providing he can go to sleep easily and

wise to use a grade that will not burn readily or that will form too many clinkers and too much waste material. A higher priced grade will be cheaper in the end.

The labor cost in connection with the handling of such a house is a hard matter to get at as it would not keep one man busy all of the time and yet he should not leave the house too long at a time especially during changeable



INTERIOR VIEW OF DUNBAR & HOPKINS' GREENHOUSES, ASHTABULA, O.

wake up easily at the call of the alarm clock. A poor heating system is expensive and annoying as it will need very much more attention than a good one.

The cost of heating a greenhouse of the size mentioned will depend on the location of both as to climate and exposure and also as to cost of fuel. It would seem that a reasonable estimate would be from \$30 to \$50 with coal at \$2 a ton. A cheap grade of coal can be used in a good boiler but it is not

weather. If the greenhouse is near the residence the wife can often look after the ventilation and fires if it is necessary for the husband to be away from the greenhouse for several hours at a time providing she has time and inclination to do such work. If we should estimate the labor cost the way many gardeners estimate the value of their time it would be a very small item indeed. In any case if the gardner has stacks of time during the winter months

a greenhouse will give him as great a return for his labor as any line of work he can engage in at that season of the year.

The young man who is thinking of engaging in the greenhouse business should not depend on books and lectures entirely to teach him how to be successful in that business. He should try if possible to get some practical training and the more the better. A year spent with a successful greenhouse man will be time well spent no matter how much

time may have been spent in studying along that line. Every student who expects to engage in Market Gardening should prepare himself so he would be fitted to take charge of a small greenhouse if the occasion should require it.

The man who expects to work as a Superintendent of a Market Garden is quite sure to have some greenhouse to look after and the person who is going into that line of work himself can usually well afford to run a greenhouse in connection with the garden.

The Nurserymen of Ohio

M. M. SCARFF, '14

THE nursery business, which today is just being recognized as one of the truly great and firmly established businesses of our state, made its first appearance as far back as 1801. When Johnathan Chapman, alias Johnny Appleseed, was first seen in the southern part of our state planting a great number of apple seeds along the borders of Licking Creek for the purpose of starting orchards for the new settlers. He deprived himself of many of the necessities of life to make other people happy, and it was by his kind works in bringing in apple seeds and starting young orchards for the settlers that started the great nursery business of today which comprises over 800 nurseries and provides work for a great army of our citizens.

There were in the early days a great number of men who entered the nursery business more for the personal pleasure which they derived from it than as a mere money making scheme, in other words it was more of a sideline. But with the development of the country the business was also increased and its possibilities were slowly but surely

brought to light and in a small way it was made a business by itself.

Swindlers also were not slow in seeing their opportunity and soon the country was full of agents, representing firms who were temporarily in the business more for fraud than for reputation. They were satisfied for several years but as with all schemes of this nature, this one too soon died away, leaving things in a very poor state not only for those who quietly swallowed the bait but also for the conscientious nurserymen who were trying to keep their heads above the already high water. But with all these difficulties there were a few who persevered and were rewarded. These few saw how far superior the business was over ordinary farming or market gardening. These men then began to study the science and art in successfully producing nursery stock and slowly paved the way for our great nurseries of today, whose owners have benefitted by the mistakes and failures of their ancestors and have built up a business which is a credit to all whom it involves.

It will probably be of interest to

know a few of the men who were the founders and something of their location in the state at that time. Between the years of 1855 and 1860, altho there had previously been a few small nurseries scattered here and there throughout the state, there seems to have been a new interest aroused, resulting in the founding of many successful nurseries some of which are our best today, while others who could not stand the rapid pace served as an example and a lesson to their more successful neighbors. It was about this period that "Father" Kinsey, as he was called by all who knew him, first started his nursery north of Dayton and paved the way for the business of Hoover and Gaines. Geo. Peters at Troy, and Peter Bohlander of Tippecanoe City, whose nurseries are both paying propositions at present, were established at this time. In the northern part of the state, Stores and Harrison, at Painesville, entered partnership and laid the foundation for one of Ohio's greatest firms. Mr. Stores was a man of unquestioned integrity and could command the assistance of much capital to expand and enlarge the business. Mr. J. J. Harrison was one whose ambition knew no bounds and not only did he make a study of his own stock but visited almost every nursery of note in the United States besides making several trips to England, France and Holland. At that time he was without any exception the best authority on nursery stock in Ohio. As the business increased it was incorporated and today this firm alone has direct control over 600 acres of nursery stock and a business which is unexcelled by any other firm in the state. Marshall, at Massilon, about 1860 established quite an extensive business which lasted a long time but he could not stand the rapid development

and failed. It was Mr. Marshall who probably did more for the introduction of the Grimes Golden apple than any other man in the state. Near Cleveland, Christopher Weigle started growing fruit and ornamental trees at this time but he, too, was left behind in the race. C. S. Pickett, who still has a very profitable business, first made plantings at Collins about 1855. He since has moved and now resides at Clyde. Mr. A. B. French also started in this line of work in the spring of 1863, and by careful and scientific management the French Nursery company still stands for all that is good. Since that time there has been a yearly increase in the number of nurseries, a great number of which last only a few years leaving the smaller percentage to go deeper into science and reap the best rewards nature can provide. Several of these later men who have attained success thru this medium are: W. B. Cole of Painesville, who has direct control of over 125 acres of nursery stock: The Fairmont Nursery of Troy, which comprises over three hundred acres, and the nurseries of W. N. Scarff of New Carlisle, which include more than two hundred and fifty acres of Ohio's best land in nursery stock alone. Others, by the hundreds, are just starting. Some of these are almost as successful as the ones previously mentioned and many of the remaining bid fair to attain success in the future.

To help this great multitude on their way there have been established throughout the state organizations known as horticultural societies which meet once each month at a convenient place in each county where all interested parties can get together and discuss topics of interest and the whys and wherefores of the business. Here the new men are benefited not only by the comradship

but also by the experience and the good judgment of the older and more firmly established members. There is also another organization known as the Miami Valley Nurserymen's Association which also serves as a binding thread among the nurserymen of that section of the state and has a tendency to promote the good feeling and cooperation so essential to success.

Nursery stock, like most other products, cannot be produced today with the same ease as years ago when the soil was new and productive and the land and labor cheap. Then a nurseryman had few enemies to fight either of the air or in the soil—root gall and aphids were scarcely known. His majesty had not let loose from the infernal regions San Jose scale, bark louse, blight, and other diseases and insects which are now so detrimental to the young as well as the old stock. So the nurseryman of today must cope with difficulties unknown to his brothers many years ago. In spite of all these adversities the business has survived and with the increases of infestations there has been a corresponding increase of scientific investigations and thru the work of the experiment stations and other state institutions these enemies have been fought to the limit. Altho in many cases unsatisfactory results have been obtained the spirit of "never give up" is still present and with that determination we bid fair to cope with all the drawbacks of the future. The laws of our state are very stringent along this line and are made to serve as a protection as much as possible. Young stock must all be sprayed in the nursery row and cared for almost as tenderly as one does for a living animal and before it can be sold, even from neighbor to neighbor, it must bear a certificate of inspection

by the authorities who yearly investigate all nurseries and condemn all infested stock of any kind or nature found. Then when all is deemed satisfactory the certificate mentioned above is issued. Stock cannot be shipped from state to state without first being carefully fumigated and bearing a certificate of such treatment.

The nurserymen of Ohio, especially the smaller ones, grow the greater part of the stock handled. The larger firms grow on an average of from two thirds to three fourths of the stock which they sell, the remainder being shipped in from states north and east of Ohio especially from New York and states around the lakes.

This business at the present time, seems to have more openings and greater possibilities than any other for the man who has a liking for nature and nature's products. Altho within the last few years there have been many and severe losses in the struggle to produce the best, this is not necessarily discouraging for the many who start each year. For the lover of nature there is a fascination in watching the growth and the development of these trees and shrubs and there is the further satisfaction of knowing that you have a business which cannot be taken away at a moment's notice—one upon which you can rely to provide all that nature can give.

The true nurseryman is an artist of the highest type. He must create from the soil and climate provided to him the highest forms of usefulness and beauty. He who can add more lusciousness to the earth's fruits or sweeter blossoms to the flower is indeed a useful citizen, and in this respect the state of Ohio has certainly planted an important stepping stone toward higher attainments.

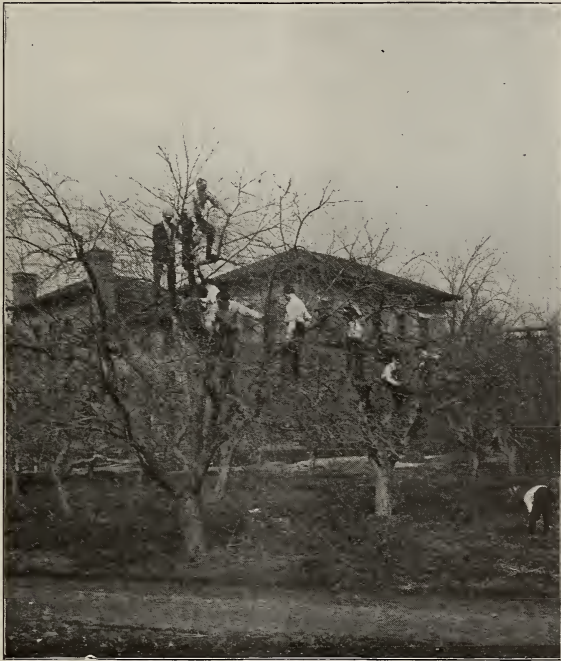
Some Orchards I Have Visited

ROBERT L. FLEMING, '14

ONE of the greatest advantages the modern orchardist has come from visiting the other successful orchards over the State. And it has been my great pleasure in traveling over this State to visit several of the orchards and to study their methods of management. In going about from one orchard to another one will always find the owner willing to lay aside any

agement as practiced by the orchardist. And it is the purpose of this article to sum up these different points; to lay stress upon the importance of some of them; and, to sound a warning in regard to other things that are expensive, non-productive, and indeed often dangerous to the welfare of the orchard.

In our orchard work we find that we



PROPER PRUNING MAKES MOST NOTICEABLE IMPROVEMENT IN AN ORCHARD.

work and show you around the place. In this way there is always a mutual benefit derived from talking over the problems that each individual has to solve in regard to his orchard work. Often we find the solution of the difficulties of one fruit grower will help another man in the solution of his own problems.

It was always my purpose in visiting an orchard to study the system of man-

agement as practiced by the orchardist. And it is the purpose of this article to sum up these different points; to lay stress upon the importance of some of them; and, to sound a warning in regard to other things that are expensive, non-productive, and indeed often dangerous to the welfare of the orchard. In our orchard work we find that we must handle the market end of the business as well as the production side of the question. In fact to the modern up-to-date orchardist and fruit grower the most important and vital thing that concerns him is the marketing end of the business. To grow a fine crop of apples is one thing but to market that same crop advantageously is quite another thing. This is the place where the orchardist proves his worth. And in

order to make a complete study of the orchard work of Mr. A and to see his work I must visit him at harvest time. We will call upon Mr. A and find him out in the orchard. He is very busy but not too busy to give us a few moments of his time and explain a few of the secrets of his success. And were this a novel rather than a report on orchards a detailed description of Mr. A, himself, would give one a clue to his success. He is a very enthusiastic young man and just bubbling over with the pleasure and enjoyment he gets from his orchard. The marketing end of any business in the hands of such a hustler as Mr. A will take care of itself. We inquire how he disposes of his stock and the reply is that it is almost always bought up before it is grown. The storekeepers and the fruit men of the city know the quality of the stock that is sold by Mr. A and this accounts for his advance orders. He is extremely careful in regard to this for he cannot afford to let anything reflect on the reputation of his fruit.

On another occasion the orchard of Mr. B was the destination of the trip. I found Mr. B at home and ready to show the orchard. At a glance we recognize him as one of these easy going fellows who enter into his work in a half-hearted manner. He is not very much concerned whether or not he dispose of his product at a tip top price. He says that he has always received a good price for his fruit and he is willing to take a chance again. Mr. B does not have an inferior grade of fruit at all, but by his manner of marketing he has not built any reputation for his fruit and so must just do the best he can. In talking with a man like Mr. B one appreciates better my former statement that the marketing end of the business proves the worth of the orchardist. And

here we have an illustration of two men who are on an equal basis in producing fruit but he is vastly superior in ability to sell the fruit after it has been produced.

Now to make a tour of the orchards and see what we can find. Mr. A has a fine young orchard. In passing through such an orchard we see a demonstration of what can be done when the trees are properly cared for. Mr. A is very careful that his trees receive the best of care and at all times he is on the lookout to remedy any defect that might arise. The trees are young—about twelve years old—and are just coming into the best period of growth and bearing. Perhaps at this point a little detailed report in regard to the management of the orchard would fit very well. The trees are headed low and are rather open but not too open to invite injury from sun scalding. They have been planted in the square method with peaches as fillers in the center of the squares. But these peach trees have passed their period of usefulness and are being dug out. The trees are thirty feet apart and the varieties are mixed so as to gain the best advantage from cross pollination. This is one point that is very important to the success of all orchards and it is the one thing that is almost never given any serious consideration. But it is fortunate for a good many orchardists that they either by accident or not have planted their orchards so as not to hinder the work absolutely. But those few who are unfortunate enough to plant their trees in large solid blocks of one variety have had an endless amount of trouble on account of self-sterility. Our orchard should never be planted in large solid blocks of one variety but should be planted with the varieties in rows. This is good insurance for fer-

tilization and thus a large crop of apples.

Mr. B also has a fine orchard. His trees are a little older than the trees in Mr. A's orchard and neither has he so many varieties. Mr. B's trees are not pruned in the same manner as the trees in Mr. A's orchard for when he set his trees it was thought best to head them high if they were headed at all. Many people held superstitious views in regard to pruning the trees and in fact it was not the general custom to prune at all, and so we cannot criticize Mr. B too severely for the way his trees are trained. But his present method of handling the trees is almost as bad as the way they are headed. When one attempts to bring an old orchard that has received little or no care up to its highest point of productivity and usefulness he must go about the work in a systematic way. If he does not do this he will come out in a worse fix than when he started. If we attempt to prune old neglected trees we should not prune too severely the first year but take three or four years to accomplish the end desired. Divide this work over this period and prune a little each year and then at the end of the third or fourth year we will have completed a good job.

Cultivation is always a point that receives very little attention from the majority of men who own orchards. Fortunately it is receiving more attention now than a few years ago for it has not been many years since it was looked upon as folly to cultivate an orchard. The problem of cultivation is an individual equation that must be solved by

each fruit grower for himself. There can be no hard and fast rule laid down for this work. We must consider the advantages and disadvantages of each system of management and then apply these principles to our problem and finally choose as our saner judgment directs. Mr. A and Mr. B have both solved this problem and while both have made mistakes and while neither have followed in detail the plan selected yet both are gaining good results from the system.

However there is a general scheme that it is always wise to follow wherever it is possible in a young orchard that is just started. And that is to cultivate and use cover crops for the first few years of the life of the orchard. There are many reasons why we ought to follow this general system in young orchards. It fills the soil with organic matter and we gain all the attendant advantages thereof, and also it forces the roots to go down deep into the sub-soil and then at any time if we ever want to cultivate it will not ruin the root system of the trees. These advantages are so weighty that this system stands out very prominently as the system to use in starting an orchard.

Now since it is not the province of this article to give a detailed description of any one orchard, with all the attendant advantages and disadvantages of the system of management, we lay aside our work. It has been the purpose of the foregoing paragraphs to tell a few of the things the author has seen in his trips around the orchards and to give their relations to the success or failure of the orchards.

The Old Farm Orchard

F. G. CHARLES, '13

THE greater part of the trend of Agricultural agitation today is either directly or indirectly toward increased production. Increased production should and must mean a better standard of living on the farm—a better standard of living equal or comparable to the standard of families in other occupations earning an equal income. This better standard of living will mean a supply of the necessities of life as well as many of the luxuries. It is right that the farmer should supply as many as possible of these necessities and luxuries from the farm, and among these stand prominently the products of the orchard and garden. For what farmer can be said to live without the fruit of both of these?

In general the farm orchards of the state impress one as being in a bad condition. Standing alone or in little groups, in the center of a permanent pasture, or huddled together in the corner of a cultivated field, the trees raise their heads high into the air as tho in an effort to get as far away as possible from the enemies that attack them. These old trees have made a brave stand against the evils of the day, but they have been deserted and too often betrayed by the hand that should have been their sure support.

The enemies of the orchard can be classed under three heads. Insect, disease and man. Of the three, man stands as the greatest barrier to the success of the orchard. He is not an enemy in the aggressive sense but through his ignorance, indifference and neglect, he becomes an accomplice with insects and diseases for the destruction of the trees. There are but

few insects and diseases that cannot be controlled if the farmer will only use the methods worked out for him by Agricultural Colleges and Experiment Stations.

Before applying these methods of orchard management to the old orchard the thoughtful farmer will ask the question. Will it pay? Each farmer must answer this question for himself, taking into account his own particular conditions. It will depend upon the age of the trees, their number, and their soundness. Most of the old trees can be brought into profitable bearing. The probable length of their usefulness will be determined by their age and soundness, and the variety will determine their commercial value. These things balanced against the value of the land for other purposes, the extra labor necessary and the value of the fruit to the family will give the answer. Old orchards that have been renewed have revived in their profitability from supplying the family with plenty of fruit to valuable commercial orchards.

After it has been decided to save the old orchard the first step to be taken will be to carefully prune the trees. We cannot expect to make as good tops on old neglected trees as on trees that have been pruned correctly from the start, but we can bring them within the range of orchards operations. If the trees have been badly neglected they should not be given the severe pruning necessary to get them into shape all in one year, but it should spread out over about three years. The first year the dead limbs and water sprouts, should be removed and the top

partially thinned out. The second year there will be more water sprouts to remove and enough of the top can be cut off to bring it down within at least twenty feet of the ground. The third year and after there will probably be more water sprouts and more thinning to do.

It is a good rule to begin pruning on the outside and work in, and at the top and work down. In cutting off limbs always cut back to a lateral branch, and never leave a stub. If the cut is properly made it will heal over in a few years, but if a stub is left, or the limb cut off without regard to a lateral branch, the wound will never heal and will furnish an entrance for fungus diseases. When there are a number of large limbs forming the head it would not be advisable to remove any of these in an effort to get a better head. The scars left by the removal of large limbs heal slowly and are therefore dangerous. Wounds over one inch and a half in diameter should be painted with a good lead paint. Some varieties, like the Wine Sap tend to set too much fruit with the result that it is small. This can be helped by thinning out the bearing wood or fruit spurs. It should be remembered that severe winter pruning induces wood growth, while summer pruning has an opposite effect.

After the first pruning has been finished the brush and other rubbish should be removed and burned, and the trees thoroughly sprayed with a winter spray of lime sulphur for the San Jose scale. This spray has also a fungicidal value in the control of peach leaf-curl. Two sprays are sometimes given for scale, one in the early winter, and the other before growth starts in the spring. The next spray usually necessary should be given when the pink of

the blossom first appears. This spray is given to control the New York Apple Tree Canker, a fungus disease, and either Bordeaux or summer spray of lime sulphur can be used. A second spray is given for this same disease when the petals fall, and since the first brood of coddling moth is beginning to hatch about this time $2\frac{1}{2}$ lbs. arsenate of lead should be added to every 50 gallons of spray.

The number of insects and diseases varies in different parts of the state and therefore the number of sprays necessary to control them will vary, but if the scale, New York Apple Tree Canker and coddling moth are controlled as above it will be generally sufficient to insure the crop against loss from these causes.

If the orchard has been in sod it should be plowed up as deep as possible without pruning the roots too much, and cultivated at intervals until the middle of the summer—when a cover crop should be sown at the last cultivation to check the growth of the trees and to allow the wood to mature before winter. This cover crop will also take up the surplus plant food, and protect the ground from frost and washing throughout the winter. By plowing under this cover crop the following spring, organic matter will be added to the soil and if the same operations are repeated the land will be built up in fertility. If cultivation produces too much wood growth the orchard can be seeded to grass and allowed to stand in sod. This will check the wood growth and tend to bring the trees into bearing. Mulching can be effectively used instead of cultivation and cover crops, but the scarcity of mulching material in quantity usually forbids its use.



OF

OHIO STATE UNIVERSITY.

A Monthly Magazine Devoted to Agricultural Education.

Published by the Students in the College of Agriculture.

Established, 1894.

Subscription Price, One Dollar the Year.

Entered at the Postoffice at Columbus, Ohio, as second-class matter.

STAFF.

O. M. KILE, '12, '13, Editor-in-Chief.

R. W. JORDAN, '14, Assistant Editor.

F. J. SALTER, '13, Art Editor.

J. W. HENCEROOTH, '14, Secondary Agr.

Associate Editors:

G. B. Crane, '13.

B. A. Schnell, '13.

E. R. Hoftzyer, '15.

J. F. Walker, '14.

B. A. WILLIAMS, '13, Business Manager.

A. J. HENDERSON, '14, Asst. Bus. Manager.

Associate Business Managers:

W. Bauchmiller, '14.

W. G. Smith, '14.

F. H. Phillips, '15.

W. G. Spanton, '15.

COLUMBUS, OHIO, MARCH, 1913.

Editorial

Responsive to Spring-time's persistent calls to garden and orchard, we present our Horticultural Number.

THE HORTICULTURAL NUMBER.

Numerous sources have contributed, and it is our purpose to here attribute credit wherever due. Several of the illustrations illuminating these pages have been very kindly furnished by the International Harvester Co., the Du Pont Powder Co., the Livingston Seed Co., and the University Editor. The names of our contributors, whose works we value greatly, appear with their respective articles.

In addition special mention should be made of the excellent efforts put forth by our assistant editor, Mr. Jordan, in securing much of the material herein contained.

In certain lines of business the principal problem is one of production. In other lines the main effort must be concentrated upon the selling proposition. In the fruit growing business, at the present time, both these problems are combined without materially lessening the difficulty or importance of either.

PRODUCING VS MARKETING

In the past the production end has probably received the greater share of attention. Improved methods are becoming so well understood now however, that production is being extensively stimulated. Henceforth the greatest measure of success will go to the producer who makes a study of the articles in this number.

Several of the articles in this number

ber of the "Student" throw considerable light upon the question. The preparation of attractive packages as described in Mr. Gribben's article, the up-to-date marketing methods as carried out at the Farnsworth farms, the suggestion and tip to vegetable growers, the description of selling methods—All have a material bearing on this problem and merit the closest study by those contemplating this field of agricultural endeavor.

The development of interest in horticulture the last three or four years

HORTICULTURAL TENDENCIES.

has been remarkable if not phenomenal. New methods of culture are supplementing the old "System of Neglect." Cultivation with cover crops, the sod mulch practice, together with systems of pruning, fertilizing, manuring and the development of the modern power sprayer have all combined to produce a product that has no superior in the markets of the country. Scores and even hundreds of spraying demonstrations are made annually in the rural districts of Ohio. Experiments are being conducted on some of the old hill orchards themselves, thus determining the best methods of practice. Within the last decade an elaborate system of orchard and nursery stock inspection has been worked out for protective purposes.

Last but not least, the attendance in the Horticultural Department of Ohio State University has increased many fold. The number of students in attendance is a fair indication of the interest taken generally. It supplements the evidence of progress presented by giving it a permanent value. One man writes: "This feverish condition of the public mind seems to be due to a germ,

or microbe, which has a life cycle of from eighteen to twenty years." It may appear to some that we are passing through a temporary revival of interest, but it must be remembered that through education we obtain the fundamental factor of continued interest. It will take the educated man, such as graduates from the agricultural college, to solve many of the problems that stand in the way of progress of the Ohio orchardist of today.

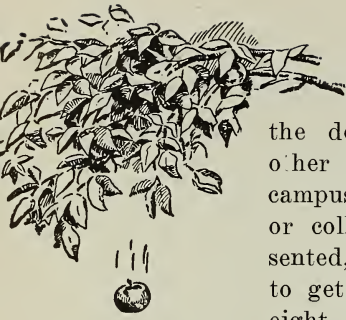
Many problems remain as yet unsolved. It will be a new order of things that brings about the adoption of a standard package for Ohio's fruit, thus giving the Ohio product a distinctive value. Certainly men have not universally solved the problem of marketing. As a result of custom and practice the orchard product now goes through much useless machinery before it reaches the ultimate consumer. Other things of greater or lesser importance might be mentioned, but one conclusion may be drawn. There is plenty or room for good material. That is indeed true of any enterprise, but it is especially true of horticultural enterprises because of the fact that many men who have the inherent qualities which mark first-class professional men are now for the first time in recent history turning towards professional horticulture.

R. W. J.

Did you notice the announcement stamped upon your class card when you registered this semester?

SAVE "The Agricultural Banquet, April 4th." Keep that date religiously open.

Your neighbors will all be there and remember that you will be missed if you are not there. This banquet has grown to be the one big class event of the year for the Agricultural College, and as



such is at once the envy and the despair of every other College on the campus. No other class or college here represented, would attempt to get together six or eight hundred of its members for an occasion of this kind, and the fact that the Agricultural College can do

so speaks volumes for the oneness of purpose and the loyalty of her students.

Really, though, it's just like going swimming—if you go once you get the habit and then after that it's a regular part of your year's program. The supper, the music, the college yells, the hilarity, the toasts, the jokes—all unite to create such an air of enthusiastic good fellowship as to become entirely irresistible—you couldn't be gloomy if you tried.

You'll be sorry if you allow anything to prevent your being present when the toastmaster drags out his joke book, clears his throat and raps for order.

Do you remember with what heaviness of heart, slowness of limbs, and inner scourgings of the will

BLESSED CHORES. you used to force yourself to drag through those detested chores which always seemed to have a way of piling up to interminable height at the very season and hour when your youthful soul craved play, and leisure, and laziness. How many times, as a boy, have you mut-

tered to yourself that if you could only rid yourself of the chores, farm life would be a pleasure. Chores seemed the very bane of our existence.

But little did you realize the strength of will power and the steadfastness of purpose that were being instilled into you by the ever-recurring necessity of doing stated things at stated times and in stated ways. Are you able to specify just what proportion of your successes at the recent examinations are due to that control of will power—the ability to make yourself labor when pleasure directs otherwise—which you learned so well at the kindling block and the wood pile? If the truth were known, no small portion of the credit would have to be passed over to these lowly instruments of training. Lucky the boy who has chores to perform, unfortunate the boy who has naught to break his uninterrupted round of pleasure and idleness while out of school. Could this be an explanation of the proverbial superiority of the country bred boy?

Time passes, customs change, aspirants progress and the new succeeds the old. The recent

NEW HANDS AT THE HELM. elections of the Agricultural Society remind us that other hands will soon be wielding this editorial quill and other minds directing the upward progress of this magazine. During the months that have passed we have come to feel very kindly toward the "Student" and it has assumed, for us, very much the attitude and presence of a personality. It is therefore with genuine pleasure that we commend it to the care of hands and minds, so eminently fitted by months of intimate contact with the actual labors, to carry the standard forward to far higher planes than it has yet attained.



With Mr. Henceroth as editor and Mr. Henderson as business manager the success of the "Student" next year is assured.

Elsewhere in these pages will be found the announcements of the editor and business manager-elect urging members of the college to come out for the various staff positions. Why not come around and get acquainted? You may be surprised at your own abilities in this line—once you but make the start. There are those who readily assert that they value the training received in this office as highly as any part of their college course. Try your hand. Get in the game. Help the new management make the "Student" a real power and a factor in agricultural education.

Scarcely a decade has passed since we ceased to marvel and exclaim at the astonishing achievements of the intricate self-binder. Last

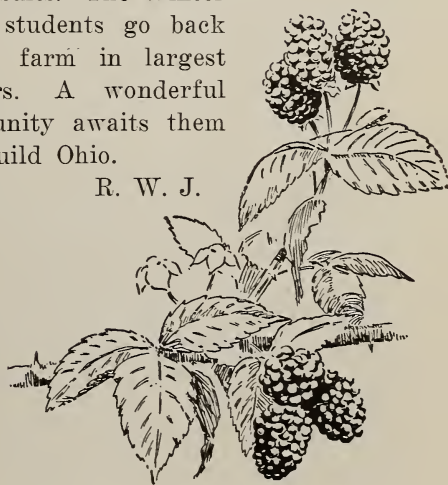
WHAT NEXT! Last year we rubbed our eyes and stared in amazement while the tractors pulled a train of breaking plows turning furrows equivalent to the results of one plow traveling at the rate of thirty miles an hour. Yesterday we caught ourselves indulging in a real gasp of astonishment when our eyes rested upon the pictured advertisement of a corn cultivator which absolutely ignores the services of "Old Dobbin and Old Dolly."

At first we hardly liked the idea of thus slighting our old friends, but already even this is finding a comfortable lodging place in our re-arranged order of the fitness of things and now we are mildly and expectantly asking, "What next?"

The Winter Course students have departed from the University for their various fields of activity. They take with them our best wishes for broader and more useful lives, both to themselves and to the community in which they reside. A new vision of farming means a new type of farming with a changed attitude towards it. The Winter Course students have certainly caught the vision during their brief tarry with us. They will go back to their respective homes and raise bigger and better crops than ever before. These progressives will concern themselves with higher grades of live stock and cheaper methods of feeding. However, it would be sad, indeed, if the short course boy or girl did not gain a different outlook on life thru associations in the college world.

The agricultural student of today has a real message to convey to his community. Depopulation of the rural districts is going on at an alarming rate. We must concern ourselves with the forces that operate to bring about such results. The Winter Course students go back to the farm in largest numbers. A wonderful opportunity awaits them to upbuild Ohio.

R. W. J.



ALUMNI WHAT THE BUSY GRADS ARE DOING

William F. Schlupp, '12, recently visited the campus. Mr. Schlupp was connected with the Entomology Department of the Wooster Experiment Station, but is now in the employ of the U. S. Department of Agriculture in the Bureau of Plant Pathology.

George Kipp, '12, is Assistant Principal and Teacher of Science in the High School at New Lexington, Ohio.

J. C. Hedge, '11, Manager of the Oak Hill Creamery, at Oak Hill, Ohio, and **Clyde Waugh**, '12, who is on the editorial staff of the Ohio Farmer, were visitors on the campus attending the Dairyman's Convention.

O. P. Dill, '12, is connected with the Bailey Falls Farm at Oglesby, Ill.

J. E. Clawson, '08, is farming near Okeana, Ohio. **Geo. N. Merrell** of the same year is farming at St. Petersburg, Florida.

Howard Call, '11, in connection with the Extension Department, recently addressed a two-day agricultural meeting at Grand Rapids, Ohio. Mr. Call spoke on "Soil Fertility."

Helen Arms, Dom. Sci., '10, is teacher of domestic science in the Piqua schools.

George C. McClelland, Ex. '03, is farming near Fredericktown, Ohio. Mr. McClelland collected statistics for the U. S. Department of Agriculture and the Minnesota Experiment Station in farm management 1906. He is a member of the Ohio Plant Breeders Association and Ohio Corn Improvement Association and along these lines has done some very valuable work.

James E. McClintock, '06, is Agricultural Editor and Agriculturist for the International Correspondence Schools, Scranton, Pa. Mr. McClintock has written many articles along agricultural lines. Among those published which might be of special interest to the readers of this magazine are, "Feeding of Milch Cows," "Oats, Barley, Rye and Buckwheat," "Winter Thoughts About Summer Insects" and "Some suggestions on how the farmer and his family may spend the long winter evenings."

Harrison E. Mickel, '11, is farming near Springfield, Ohio.

H. E. Allen, '09, was associate Professor of Animal Husbandry at Virginia Polytechnic Institute, 1909-10, and since 1910 has been connected with Purdue University in the same capacity. Mr. Allen has written much along his line of work, principally newspaper articles.

Mr. Leonard Lehman, '12, has recently accepted a position as manager of a large dairy located at Rochester, Minnesota.

Elmer D. Ball is director of the Utah Experiment station. Mr. Ball received the degree Bachelor of Science in 1895 and the degree, Master of Science in 1898 at the Iowa Agricultural College. He attended the Ohio State University in 1900-01, and 1906-07, and received the degree, Doctor of Philosophy in 1907. He has published several very interesting bulletins and scientific articles on "The Control of the Codling Moth."

Earl L. Bowser, '06, is assistant manager of the Helvetia Milk Condensing Company, Wellsboro, Pa.

Earl W. Benton, who attended the University 1908-10, and received a certificate in Agriculture in June, 1910, is farming in Mercer County, Ohio.

L. G. Bloomfield, '91, who spent several years in the Philippines, is now instructor in Agriculture in the State High School at Hinkley, Minnesota. He pursued post graduate work at Wisconsin during the summer of 1910.

C. D. Lowe, '10, who has been located as a veterinary inspector at Atlanta, Georgia, for some time, announces his change of residence to Dalton, Ga.

Charles L. Miner, '06, who now resides at 11919 Mt. Overlook Road, Cleveland, Ohio, writes as follows, "I have been moving around so much that I have not heard from the Alumni Association and wish to get in touch with it, and would like to hear from you in regard to it." Perhaps others would like to know about it. Send us a card, tell us what you are doing and what you wish to know about the Association.

Robert C. Wright who received his degree, Bachelor of Science in 1908 and the degree Master of Science in 1912, is now connected with Bureau of Plant Industry, U. S. Department of Agriculture. Mr. Wright is Soil Bacteriologist and is located at Riverside, California.

True Houser, Ex. '05, has been assistant Botanist at the Ohio Agricultural Experiment Station, Wooster, Ohio. Mr. Houser is also connected with the U. S. Department of Agriculture. He is collaborator in the Bureau of Plant Industry. Along this line of work Mr. Houser has published several articles on the breeding and growing of tobacco in Ohio.

Bernard H. Avery, Ex. '10, is farming near Bowling Green, Ohio.

Franklin P. Stump, '92, is farming near Conway, Ohio. Mr. Stump is a breeder of Pure Bred Red Polled cattle and Berkshire Swine.

Frank J. Boynton, Ex. '02, is farming near Haverhill, Ohio.

Clara Campbell, Dom. Sc., '05, is supervisor of the Domestic Science and Art Department of the Norwood Public Schools.

Maxwell E. Corotis, '08, since graduating spent one year at the Wooster Experiment Station and then returned to the University taking graduate work and assisting in the Botany Department. After finishing his graduate work, Mr. Corotis was Supervisor of the Children's Gardening Work and Vacant Lot Farming of Columbus, where he obtained splendid results. At present he is District Agent for the Midland Mutual Life Insurance Co.

George A. Crab, '07, is connected with the U. S. Department of Agriculture. Mr. Crab is Scientist in the Soil Survey Department of the Bureau of Soils.

Faith Lanman, Dom. Sc., '03, who taught Domestic Science and Art at St. Petersburg, Florida, 1903-06, is at present Director of Domestic Science in the Public Schools, Columbus, Ohio.

Lucy P. Beldon, Dom. Sc., '09, is a nurse at Middlefield, Ohio.

E. W. Benton, '08 and '09, is farming at Haverhill, Ohio. **E. F. Clapp**, Ex. '03, is farming at Spencer, Ohio.

H. W. Coddington, Ex. '01 is another tiller of the soil near Medina, Ohio.

L. H. Bricker, Ex. '02, is a vine gardner at Stockton, Calif.

Maida Rutan, Horticulture '94, is married and resides near Mechanicsburg, Ohio. Her name is **Mrs. A. E. Bullard**.

CURRENT AGRICULTURAL LITERATURE

COMMENTS AND CRITICISMS ON CONTEMPORARY CONTRIBUTIONS

Dr. Cyril G. Hopkins of the Illinois Experiment Station has a series of four articles running in the *Country Gentleman* entitled, "The Farm That Won't Wear Out." These present some of the fundamentals of permanent agriculture as have been worked out by Dr. Hopkins at the station.

The *Gasoline Engine on the Farm*. By Xeno W. Putnam. A 527 page text intended for the workman on the farm covering the subject in a most thorough manner. The details of gasoline operation are discussed from every angle in a non-technical manner. Its operations under many possible conditions on the farm are considered from orchard to wood-pile to the use of the modern tractor for plowing and hauling. The text contains a large number of illustrations together with a list in the center. Published by N. W. Henley Publishing Company, 132 Nassau St., New York. Price \$2.50.

Modern Strawberry Growing is the title of a new book written by Prof. A. E. Wilkinson of Cornell. The text is the only one published during the last twenty-five years on strawberry culture. It represents a vast amount of material from the work of many Experiment Stations, carefully collected, selected and "boiled down" to 208 pages. The book covers the subject in the usual manner with additional chapters on Winter Forcing, Scoring and

Judging, Alpine Strawberries, Fall Bearing Strawberries and varieties for Special Purposes. The book is illustrated with thirty-two full page illustrations. Doubleday, Page and Company.

The February issue of *Current Opinion* reviews an article recently written by Prof. J. Russel Smith of the University of Pennsylvania. The review is entitled, "What the New Agriculture Means to the United States." Prof. Smith predicts the possibilities of doubling the food supply of the United States thru application of modern methods of plant breeding. Seeds and vegetables used as foods have not in past and historic times been picked out scientifically. Hence they do not possess maximum utility. Prof. Smith lays emphasis on certain tree crops. He says, "Analysis show that the efforts of unaided nature have produced richer foods in the nuts of trees than in the kernels of grains."

Following the lead of several semi-popular agricultural publications "*Country Life in America*" is publishing a serial story purporting to be descriptive of the life and adventures of an Ex-Dry-Goods Merchant who has broken away from the city and cast his fortunes with the farm. This series entitled, "That Farm" shares the common summation of articles of this type namely; it is quite readable, it con-

tains a great deal of truth, but is rather highly and somewhat artificially colored.

"Rural Credit in Germany" is the title of a new bulletin issued by the University and written by Dean H. C. Price, of the Agriculture College. Dean Price spent the greater part of last year studying this subject in Germany.

The Literary Digest of February 8 reviews a part of Secretary of Agriculture Wilson's report. The report covers a period of sixteen years of his administration. The growth of the department as well as the advancement of scientific agriculture during that time is discussed as a whole, together with its effects direct and indirect upon the uplift of agriculture and country life.

The Country Gentleman for March 1st contains an article by Professor F. S. Jacoby, of the Poultry Department of the Ohio Agricultural College. The article deals with the poultry disease known as "roup" and gives in detail the vaccination method of treatment as

carried out with a serum developed at the University. This is a new phase of the treatment of poultry ailments and is being watched with much interest by prominent poultrymen.

The Draft Horse in Ohio, Ohio Farmer, February 22. By Henry W. Vaughan, Ohio State University. The development of the draft horse since its importation from Pennsylvania about one hundred years ago is related. A considerable amount of historical matter is presented together with references to earlier periodicals.

The Breeders' Gazette for February 15th contained another leading article by Samuel R. Guard. The article describes the Ohio hog cholera serum plant, located near Reynoldsburg, and discusses the causes of cholera, the methods of preparing the vaccine serum, and the general status of the preventive treatment at the present time. In view of the impending state and national legislation of this subject the article is of especial interest at this time.



WITH THE BREEDER

NOTES OF INTEREST AMONG THE FLOCKS AND HERDS

Last month the Western Reserve Holstein Breeders' Association met at Burton, O. Decisive and immediate action was taken in reference to the bill compelling compulsory tuberculosis testing. The interests of the dairy work in the Legislature are being watched carefully and eagerly these days.

Interesting and educational results are being obtained from the Egg Laying Contest held at Storrs College in Connecticut. The results of this contest will be published shortly and will be of great interest to the man interested in fresh eggs.

The highest price that was ever paid for a young draft horse was reached recently in London, Champion's Goal Keeper, a Shire colt which was junior champion of the London show last year, topped the sale at the price of \$20,500. Such a sale as this gives one an idea of the persistence of the English in adhering to breed type. If this sale can be taken as an indicator, the cause of the Shire horse will be greatly increased and obtain a stronger foothold in the horse world.

Mr. A. C. Jones of Yorkville, Ohio, recently had a sale of Jersey cattle which proved to be a success. Mr. Jones is classed among the prominent breeders of Jerseys in the state and his stock is of the best.

The ever enterprising Poland-China men recently held their annual meeting at Dayton, O. Discussions of the various phases of the work were conducted and several papers were read. Reports indicate that a very successful meeting was held.

The latest innovation of animal husbandry instruction comes from the Oregon Agricultural College, where a course in goat husbandry has been inaugurated. This is certainly a new phase of the work but is one which is needed and deserves acknowledgment in the curriculum of the college.

H. A. Lehman, an enthusiastic student from Troy, O., is becoming a Fancier of Guernseys, and twelve head of registered animals now grace the herd at Sweet Springs Farm. Seven of these animals are heifers which were purchased near Philadelphia, Pa., and are granddaughters of Masher Sequel. With one exception the mother of all these young animals are in the advanced registry. With this foundation there ought to be bright prospects for a good herd.

It has recently been decided by the management of the International Live Stock Show that Futurity classes for draft horses will be included in 1913 program. \$200 has been appropriated for each of the draft breeds by the exposition, and a like amount will be

contributed by each of the breed associations. In the case of the Clydesdales an extra \$200 has been contributed by the Canadian Association. Classes will be provided for stallions and fillies foaled in 1912, and the winning colt in each class will secure at least \$100. The futurity idea is a popular one and it is expected that the 1913 International will see a wonderful show of young stock.

C. R. Doty of Charleston, Ill., recently purchased some lamb and yearling wethers from the Animal Husbandry Department. It is the purpose of the new owner to exhibit these animals at the Fort Worth Show early in March, and there is a possibility that some of them may ultimately find their way to the Texas Experiment Station. The purchase included 2 Oxfords, 4 Cheviots, 1 Shropshire, and 6 lambs. In addition to the sheep Mr. Doty also purchased 2 Yorkshire barrows.

Washington's birthday was fittingly celebrated at Yorkville, O., where a dispersal sale of Register of Merit Jerseys was held. The value of the advanced Registry testing for farm breeders was emphasized at this sale. Buyers seemed very anxious to obtain Register of Merit cows or their offspring and the bidding was brisk.

Dr. Takamatzu, a graduate of the Imperial College of Agriculture at Tokyo, Japan, was a visitor at the Agricultural College on the first of the month. For the past three years Dr. Takamatzu has been making a study of the Agricultural conditions of Germany, and has made the study of Animal Breeding a specialty. At present he is investigating the conditions of the United States and contemplates re-

turning to Japan this fall by way of the Southern Asiatic countries. In comparing Ohio State with foreign schools he was very much pleased and passed favorable comment on the work of the Agricultural College and the University in general.

Russia is after The Harvester. She has offered \$100,000 for him. But she can't have him. Mr. Billings says that there is a greater value than a financial consideration placed on him. We wish this was also true of the other great breeders which she has obtained.

The Percheron Society of America expects to expend \$9,430 in cash premiums during the coming year, and it is estimated that additional expenditures for ribbons, cups, medals, judges, etc., will make the total outlay for the season nearly \$17,000. Liberal premiums for Percheron horses have brought impressive exhibits to all our leading shows, with the result that hundreds of new breeders have gone into the Percheron business in the last few years.

One of the finest Holstein bulls of the Hillscroft Farms, owned by George R. Hill, and which was valued at \$5000, met his death recently by swallowing a darning needle which was in his hay.

R. R. Buchanan of Ripley, O., and D. Leyda of Augusta, O., have been recent purchasers of University Berkshire stock.

A great amount of horse flesh changed hands at the International. One of the largest sales was made to J. Crouch and Sons of Illinois by the famous horse dealer M. A. Rasmussen. This company bought five Percheron mares of excellent type for \$10,000.

Secondary Agriculture

Devoted to the Interests of Agricultural Education in High and Common Schools

Most parents are willing to aid their children if they show an interest in a certain line of work. Teachers, you can interest some of the children in orcharding, while others will be more interested in small fruits, such as strawberries, raspberries, blackberries, or in rhubarb and vegetables. These are crops that require very little space. Often there is an odd corner where some rhubarb may be set out or some cabbage or potatoes planted and thus many an odd dollar may be earned by the child. How proud we all were when we earned our first dollar. Help the children plan for a small truck or berry patch and thus solve the problem of interesting them in better agriculture.

As many of the farmers are setting out young fruit trees and cleaning up the old orchards, it will be well to do some horticulture work in school. The budding, cutting back, setting out, etc., of young trees is brought out very clearly in the discussion between "Father" and "Son" in this issue. Explain carefully just how to bud, graft, cut back, plant, and cultivate the young tree, and also impress upon the children some of the profits to be derived from an orchard.

The pupils of Professor Ray's school at Basil, Ohio, tested sixteen bushels of seed corn for the farmers of the community last year. The pupils took a great deal of interest in the work and

the farmers were glad to have them do it. That is one way of making the schools serve the community.

Mr. J. M. Collins, Supt. of the Springfield Township schools in Clark County, has been very successful in arousing interest in agriculture by holding a series of lectures. These lectures are held on Friday afternoon or Saturday and are especially for the teachers and the eight grade pupils, though others are not debarred from attending them. The speakers are furnished by the Extension Department of the College of Agriculture and the meetings have proven to be very interesting. So far they have discussed the buying of nursery stock, the pruning, spraying and planting of the same. A nurseryman near at hand has given a certain number of trees to be set out on the school grounds. These will be properly planted and tended and thus prove a valuable object lesson to the children and their parents.

Another subject that has been discussed is corn. The testing of the seed, structure of the kernel, stalk, etc., has been explained. The drawing teacher is correlating the drawing work with the agriculture and it is proving to be a good plan. They are also preparing a booklet in which they place various drawings of the corn, the plant, and also a record of a number of germination tests that they are running.

Corn Germination Tests.

Be sure and make germination tests of seed corn this spring. There are a number of good ways to carry out the test and the beauty of this work is that a home-made tester is the best. All that is needed is a shallow box and some sand or sawdust. Place a layer of either the sand or sawdust in the box and pack it down well. Then drive some large tacks around the edge of the box, one and a half inches apart, having those on opposit edges of the box directly opposite one another. Stretch some cord across the box both

by fastening it to the ear by a rubber band. In selecting the grains for the test take six; one from near the butt of the ear, then turn it one-sixth way around and select one from near the center, then one-sixth way around and select a grain from near the tip, then turn one-sixth way around and begin at the butt again—this insures a uniform selection from the ear. Allow the corn to get about one to two inches high before taking the readings. Make a record of all perfect, weak, and dead kernels. The vigor and color of the stalks should be noted as well as the



A HINT TO THE WISE.

ways, thus dividing it into little squares and number these squares from one side and one end as any group of squares are numbered. Place six kernels in each square, cover them over and allow them to germinate. Be sure and keep the contents of the box moist, especially around the edges where it is most apt to dry out. Keep the box where conditions are as nearly natural as possible. If the weather is warm, set it outside during the day and take it in at night.

Label each ear of corn either by sticking a pin through a bit of cardboard and into the butt of the ear or

fact that they simply grow. Reject all ears that show dead or even a moderate per cent of weak kernels. Make this test at once so the pupils may have time to test their father's corn before planting time.

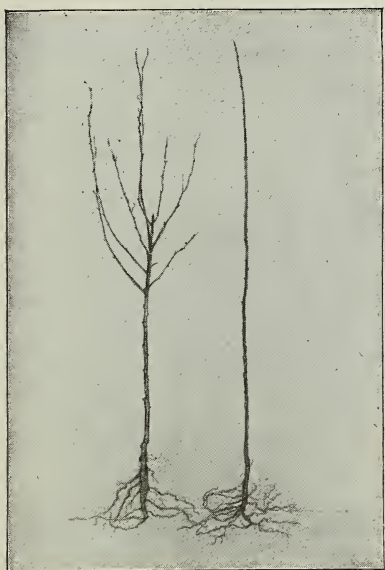
Last Saturday the schools of Springfield Township, Clark County, exhibited their work at the Court House. This is an annual affair in which all the schools take part and has proven extremely interesting and profitable. Emphasis is laid on the agricultural work, including special collections, drawings of plants, grain, fruit, etc.

Father and Son Discuss the Planting of the Orchard.

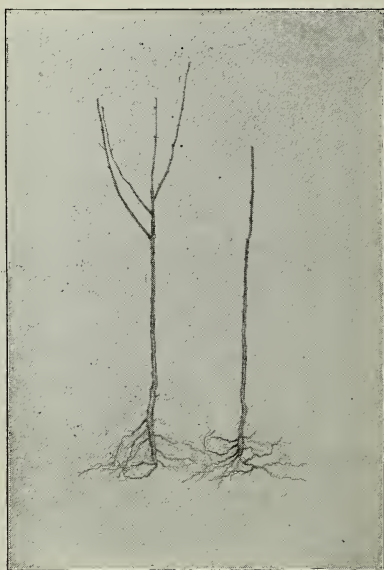
"Well, son, what are we going to do with that old sidehill pasture lot? It is so rough and hilly that it makes me ache to think of plowing it, but it hasn't paid taxes for the last five years. Grass doesn't want to grow there any more than the briars and golden rods are running in pretty fast. I wish we didn't have it, for it makes all the rest of the farm look cheap."

more or less of a luxury on our table ever since. Why don't you let me see what I can do with an orchard on that lot? It still grows big weeds and the old cider apple tree bears well in spite of its ill treatment and neglect. The top soil is badly worn from pasturing, but there is still much fertility which tree roots can use.

"I will spend this season getting the ground ready. It won't take long to dispose of the briars and bushes and



TWO-YEAR-OLD AND YEARLING APPLE TREES BEFORE PRUNING.



SAME TREES AFTER PRUNING.

"Yes, father, the old system of farming fails to work there any more, but I have been reading up lately and I believe I know a way by which this same old lot may still be made to yield good profits and add both to the value and to the appearance of the place. You remember how mother and the rest of us protested when you dug up the old orchard because you thought the land was worth more for crops. You said you would rather buy enough fruit for the family, but somehow it has been

clean it up so it can be plowed. Then I will haul the straw from those old stacks you wanted out of the way and all the manure you can spare and spread it on before plowing. The old pasture often gets pretty dry and this will help it hold moisture as well as furnish something for the young trees to live on. The failure of grass also shows the need of lime and I would like to put on a ton per acre, if you can help me out with the expense. We can till it in after plowing and then in

order to prevent washing and keep the briars and weeds from getting a new start and at the same time add some fertility to the soil I will sow the ground to sweet clover."

"Sweet clover! Now listen to me, son, do you suppose I am going to have any of that stuff sowed on this farm? Don't you know that's one of the worst weeds this side of Hades? Why, we'd be the laughing stock of this neighborhood. What do you want to sow that for?"

"But just let me explain, father. True, it used to be regarded as a bad weed, and no doubt is when in the wrong place, but now it has found its place and its use, for fruit growers tell us that it is quite valuable in orchards and as a pasture plant and that its use is becoming quite extensive. Perhaps some of the neighbors will laugh, but you can laugh back with better grace when they fall in line.

"Next spring the ground will be ready to plant. But there is one other thing I would like to do in the fall which will add a little expense. Apple trees will not thrive where water stands around their roots. Part of the old pasture is quite wet in the winter and spring and these wet places ought to be drained. If you will furnish the tile, I will put them in.

"I will lay out the ground so as to have forty permanent trees per acre. But during the first fifteen years there will be room for nearly twice as many, so I will plant at the center of each square of permanents a tree of some good early-bearing variety. This can be removed in time to avoid crowding the others and still stand long enough to bear several good crops."

"But here's another thing, my boy, where are you going to get all those

trees? I haven't any fifty dollars to throw away on some rascally fruit tree agent; and when you send away its about as bad, for you never can tell what you are getting until your trees begin to bear cider apples."

"No, father, I'll not ask you to do either one. I am sure the University could refer us to people who would furnish us honest values at a reasonable price. But if you think you cannot spare the money I will use those trees of mine out there by the garden. They are all good standard varieties. We may have to buy a few for the inter-planting."

"Ha, Ha! Now I see how little you really know about planting an orchard. Those trees of yours have never been grafted. No matter what variety of apples you plant seeds from, you never know, son, what kind of fruit your seedling tree is going to produce. You have to graft on the variety you want."

"Yes, you have to graft them unless you bud them. Last fall, early in September, while you were away at the fair, I got scions from Uncle Dick's neighbor's trees and budded mine. It is a simple process. You just cut one of the buds from a fresh scion with a sharp knife, making a disc of bark about an inch long and taking a little of the wood just under the bud. Then you make a T cut in the bark of the seedling just above the ground and slip the bud disc down the vertical slit under the bark. The bud is then bound in firmly with soft yarn for a few weeks until it heals in. This spring I will cut off the tops of my trees just above the buds and they will grow long, whip-like tops without branches. These make the best trees for planting. They will be ready next spring. For the permanents I have York, Delicious, Jonathan,

Stayman, and Grimes; for fillers, King, Maiden Blush, Snow, Oldenburg, and Wealthy.

"When planting I will cut back the whip to about twenty-four inches. The buds left will then throw out several strong side branches during the summer, and from these, the second spring, four can be chosen, spirally arranged about the stem and about four inches apart, which are to form the main branches of the tree. The rest can then be cut out.

"Thus the use of the yearling trees enables one to form tree tops to suit himself. My trees will have tops near the ground and therefore easy to spray, easy to prune and easy to pick. They will also be open, which will afford plenty of leaf surface and insure well developed fruit of good color and quality."

"Well, well, son, there's no use talking, you surely have got the principles of orcharding down pat. Go ahead and plant the old orchard if you want to, and I'll see you through and promise

you a fair share in the profits. Some day soon we'll talk it over further."

W. R. Wheelock.

This is the day of Boys' and Girls' Clubs, Corn Growing Contest and various other sorts of competitive demonstrations. The Editor had the privilege of helping carry on a contest between the schools of one community. There was a corn and tomato growing contest for the boys and a bread-baking and flower-growing contest for the girls. A philanthropic lady of the neighborhood gave the money for the premiums and the contest proved to be very successful and profitable to all concerned. Any teacher can conduct such a contest this summer, and it will be of more real service to the children than many recitations from a text book on the growing of corn or the baking of bread. Next month we will have an article that will deal more fully with this subject. Any one desiring information on this subject may receive help by writing to the Editor of this department.





New Notes

The central Y. M. C. A. opened the Poultry Course, which it is conducting this winter, on the 19th of February. Prof. F. S. Jacoby has charge of the class and each Wednesday night will give a talk on some phase of Poultry Husbandry.

Prof. R. F. Griggs, of the Botany Department, has inaugurated a new plan of work for the students in Plant Pathology. Each student will work out the fungus diseases of some plant or plants that are raised on the Farm. A study of the rots of various apples and an investigation of various potato fungi are examples of the work carried on.

Good roads received a boost from the Engineering department this year in the form of a short course in highway engineering which began Feb. 24 and lasted two weeks. Regular classes were scheduled and lectures given by outside experts and University professors. Among the more noted lecturers were: Jesse Taylor, President of the Ohio Good Roads Federation; James T. Voshell, U. S. Highway Engineer; Arthur N. Johnson, State Highway Engineer of Illinois; Sanford E. Thompson, Consulting Engineer, and Wm. P. Blair, Secretary of the National Paving Brick Manufacturers' Association.

Townshend Literary Society continues to thrive, having conducted some very interesting meetings during last semester and planning to continue these debates and talks throughout this semester. The new officers are: J. F. Walker, President; J. Tulloss, Vice-President; A. L. Fleming, Secretary; D. L. Augenstine, Director of Music; Leo Rummel, Censor; W. G. Smith, Critic; Karl Hirn, Sergeant-at-Arms.

In the first convention of Alumni Secretaries of the National Intercollegiate Association twenty delegates representing schools from New Hampshire to Colorado were present at Ohio State University. Discussions were held in reference to class reunions, entertainment of visiting alumni at commencement time and the relations of the alumni organizations to the governing body of the schools.

Officers elected for the ensuing year were: J. B. Johnson, Minnesota, President; A. S. Warwick, Ohio State, First Vice President; G. B. Compton, Columbia, Second Vice President; W. B. Shaw, Michigan, Secretary; A. T. Prescott, Louisiana State, Treasurer.

One portion of the Greenhouse, next to the Horticultural Building, is now growing a fine bed of winter lettuce.

Thirty-nine counties in Ohio decreased in population between the years 1900 and 1910, the rates of decrease ranging from one-tenth of one per cent in Lawrence County to 17 per cent in Paulding County. In 1900 the rural population of Ohio was 2,159,163, the city population 1,998,382. When the decade closed, the rural population had suffered a loss of 57,185 inhabitants and the urban population had increased more than 650,000.

Clark County of this state has an organization called the Fish and Game Protective Association, whose object is to protect and propagate wild game and fish and to encourage its members to win the great out-o'-doors with its genial sunshine, alluring forests, undulating fields and attractive streams. They have over 1200 members and it is the largest organization of its kind in the country.

A practicum in the cooking and carving of a fowl was given to the Poultry students a few weeks ago by one of the Domestic Science instructors. Baked chicken was in evidence in all parts of the plant and was indeed relished by the students when served.

The membership of the University Y. M. C. A. was increased over 250 by the recent campaign conducted by the organization. There are now 750 enrolled in the Y. M. C. A.

Four hundred and seventy-seven dollars were expended in Ohio last year to fight tuberculosis. Over 18 million were spent in the United States.

An inter-county ditch, to cost \$75,000, is to be put through Hancock, Putnam, Wood and Henry Counties.

The Middle West Soil Improvement Committee and the Ohio State Board of Agriculture are together offering \$3000 in prizes for various educational exhibits at the State Fair next year. Four individual prizes for each county in the state are offered. These being for the best collection of agricultural products, while each separate school in the state is given a prize, win or lose. Prizes for the best school exhibits in each of the four agricultural districts are offered.

Community Hatching, inaugurated by Prof. F. S. Jacoby in this section of Ohio, is being well received by many people. Since the time of announcement of this phase of poultry husbandry, many people throughout the state have sent their eggs to the department for incubation. Results are promising and little doubt is entertained of its future.

The annual meeting of the Ohio State Dairymen's Association was held in Columbus, Feb. 13-14. The full attendance and interest at these meetings plainly evinced the fact that Ohio is coming to the front as a dairy state. Pasteurization, tuberculosis, feeding, and proposed legislation were subjects which claimed attention. Community breeding and co-operation were encouraged. The banquet was held Feb. 13, with 180 in attendance.

Prof. G. L. McKay, of Chicago, and Stephen Francisco, of New Jersey, the first producer of certified milk in the United States, were in attendance and appeared upon the program.

Resolutions were passed by the association asking the legislature to fix standards for cream and ice cream, opposing compulsory tuberculin testing, and opposing the proposed central con-

trol of the Agricultural College, the Experiment Station and the Board of Agriculture.

The new officers of the association are as follows: President, L. P. Bailey; Vice-President, Paul McNish; Secretary-Treasurer, Prof. Oscar Erf.

In conjunction with the Dairymen's Association the Ohio Jersey and Guernsey Cattle Clubs and the Holstein-Friesian Association held their annual meetings.

A total registration of 3169 in all departments of the University is reported by the registrar for the second semester. The figures are somewhat behind those of last semester. The statistics by colleges are as follows:

Agriculture	979
Arts	708
Arts—Education	12
Education	102
Engineering	673
Community School	80
Law	167
Pharmacy	70
Vet. Medicine	145
Short Agricultural	212
Dairying	21

Total 3169

The Department of Agronomy has recently purchased a new Dynamometer for experimental work. This is a piece of apparatus used in testing the draft of farm machinery, such as plows, harrows, cultivators, etc. The class in Farm Machinery, under the direction of Professor Ramsower, will use the Dynamometer in testing the draft of different makes of plows, and also different kinds, such as the walking, riding, gang, and Spaulding Deep Tillage Machine. They will also test the effect of the coulter and jointer on the draft of the plow.

The Freshman Animal Husbandry classes gave a silver cup and three cash prizes, of three dollars, two dollars, and one dollar respectively, for the Boy's Judging Contest at Delaware. This contest was held under the auspices of the Ohio Live Stock Association on March 14, 15. Only boys under sixteen years of age could compete and considerable interest was aroused among the boys of that community.

The Extension Department will run an Agricultural Train over the Norfolk and Western during the week of March the 17th. Lectures on Animal Husbandry and Field Crops suitable to that section will be given. Instruction will be given by the men of the Extension Department assisted by some of the regular College Professors. Short stops will be made at each station and night meetings will be held at important points. Arrangements are being made to collect seed corn from the farmers at the various stops and bring it back to the University to be tested.

Death of Dr. De Laval, Inventor of the Cream Separator.

Carl G. P. De Laval, known throughout the world as the inventor of the cream separator, died on February 3rd, in Stockholm, Sweden, his native city, at the age of 67 years.

Dr. DeLaval was best known to fame for his invention of centrifugal cream separators and as the founder of the cream separator concern which bears his name.

His activities, however, were by no means confined to the development of the cream separator. He was one of the most prolific and versatile of the world's great inventors and in addition to his invention of the first con-

tinuous cream separator he achieved notable success in various other fields of scientific endeavor and practical usefulness.

Shortly after his invention for separating cream from milk by means of a centrifugal machine in 1878 he invented the steam turbine which bears his name. Among other of his notable inventions were the milk tester, a centrifugal churn, an emulser, a mechanical cow milker, a new form of lamp, a frictionless vessel, an explosion-proof steam boiler and a process for extracting metals from ore by electrically developed magnetism, in fact he was tireless in his activity in working out unsolved mechanical problems of every kind, and until the very last he continued actively at work in his experimentation of old and new projects, his brain as fertile and his energy as unremitting as ever.

Many honors were bestowed upon Dr. De Laval. From the King of Sweden he received the Cross of Commander of the Order of Wasa and that of Knight of the Order of the North Star. He was made a member of the Academy of Sciences in 1886 and received the Academy's gold medal in 1892. In 1896 he was made an honorary member of the Agricultural Academy in Sweden and in 1904 the Engineers' Society of Germany unanimously awarded him a medal for his pioneer development of the steam turbine.

Few men have conferred more lasting benefits upon mankind than Dr. De Laval. The cream separator and the milk tester, both conceived by him, though further developed by others, have alone saved billions of dollars to the world's dairy interests and largely made possible the wide use of dairy products as we know them today.

Dr. De Laval well deserved the com-

parison so often made of him with our own great Edison. As the inventions of Edison have made possible the tremendous advance in the development of electricity and its practical application, so dairy machines invented by Dr. De Laval have made possible the equally wonderful progress in the last 25 years in the field of dairying, and Dr. De Laval has rightly been called "the Edison of dairying."

After eight weeks of studying and obtaining a few great truths of Agriculture, 175 students of the short course of Agriculture received certificates at the chapel on the last day of February. The principal speaker was Dr. W. J. Chamberlain, associate editor of the National Stockman and Farmer. Dr. Chamberlain spoke of the manifold possibilities and advantages which were open to the progressive farmer of today. He passed favorable comment on the work of the College of Agriculture and the many blessings and benefits which it was bringing to the farmers. Following his address Prof. H. C. Ramsower and Dean H. C. Price of the College of Agriculture presented the certificates and closed the exercises by wishing them good luck and inviting them to return to the College in the future

The Townshend Athenean annual debate took place in the chapel on the evening of March 8th. The question was, Resolved, "That it is advisable to remove the Ohio Penitentiary from its present location to a farm," and this proved a live issue as it is under discussion at the present time and is calling forth much comment. The debate resulted favorably for the Townshend Society who debated the affirmative. They received the beautiful pelt trophy

to hang in their society room as a token of the victory. The winning team was loyally supported by a group of well organized rooters and cheering and clapping was frequent. The Athenean team was composed of Arthur Van Meter, Robert A. Good and Frank Watson who pushed their opponents to a hard victory. The Townshend Society was represented by V. B. Ditrick, L. L. Rummel and J. F. Walker.

An Examination In Horticulture.

By "Witty Witful."

Visitor at Short "Ag" Examination.

I.—What is a whole root, a piece root? What is budding? Wherein lies the value of pedigreed trees? Answer—A whole root is one that has not been broken. A piece root is a piece of the whole root and the whole is equal to the sum of all its parts as we learn from Geometry. Budding is splitting the bark and sticking in a bud from a tree one wants and smearing wax on the outside. One should put two or three buds on so that if some do not grow others will. The value of pedigreed trees is to make lifelong enemies out of college chums who have shared the same gum and dance tickets. Let two such persons start to growing fancy fruit and they will fight for blue ribbons like a man and his mother-in-law.

II.—What is a cover crop? Answer.—A cover crop is one used to cover the ground and keep it warm. Buckwheat should be used instead of clover when one has more honey than buckwheat cakes.

III.—How would you train a young tree? Answer—I would teach it to be calm, serene, cultivated, and upright, but I would not spare the branch and spoil the child. Use common sense, and corporal punishment only when necessary.

IV.—What are the two important classes of insects and how are they combated? What is fungus growth? Answer—The two important classes of insects are bugs and worms. The first may be combated by smashing them between two blocks, the second by setting one's foot firmly on them. Fungus is what a stone gathers when it doesn't roll.

V.—Give the formulas for Bordeaux and Lime-Sulphur and tell how they are applied. Answer—Mix three parts of Bordeaux with one part of water and take before and after meals. Warm equal parts of Lime-Sulphur and lard and apply externally to injured place. Boil the lime yourself and set in a cool place to harden. When cold serve with sliced bananas and whipped cream.

ANNOUNCEMENT

The newly elected Board is desirous of getting acquainted with students who would like to get on the staff of "The Student" for next year. If you are interested in either the business or editorial work of the paper, see the newly elected Editor or Business Manager at once. New men are needed and they should come out and get acquainted with the work.

Our Collegiate Advertisers

Fellow Students, let us show our appreciation not only by giving these firms our trade, but by boosting them to our friends. A thousand students here in school ought to be a class that any firm would be glad to get their goods before. Look over this list of advertisers and do your business with them, at the same time mentioning your connection with "THE STUDENT."



SEASON 1912-1913.

To Those Who Neglected to Learn to Dance

Prof. W. J. Rader's Academies of Dancing

will organize beginners' classes as follows:

SOUTH HIGH ACADEMY,

199½ S. High St. Phones: Auto 3456; Bell 5877.

Will organize a beginners' class Wednesday evening, March 26th, 7:30 o'clock.

NEIL AVE. ACADEMY,

647 Neil Ave. Phones: Auto 4431; Bell 6189.

Will organize a beginners' class Friday evening, March 28th, 7:30 o'clock.

OAK ST. ACADEMY,

827 Oak St. Phones: Auto 4431; Bell 6189.

The Academy has been rearranged for functions of all sizes and is complete in every respect.

TUITION

Gentlemen, per term of 10 lessons..... \$4 00

Ladies, per term of 10 lessons..... 3 00

Private lessons, \$1.00 per lesson; six lessons..... 5 00

Private lessons can be had afternoons or evenings.

Tuition can be paid \$1.00 per week until paid. The Waltz, Two-Step, Three-Step, Colum-

bus Minuet and Rye Waltz taught in one term.

WINTER PAVILION—Located on Neil Ave., between Goodale St. and Poplar Ave. Open

Friday and Saturday evenings. Operated on Summer plan.

ACADEMIES AND PAVILION CAN BE SECURED FOR PRIVATE PARTIES,

CLUB DANCES, FRATERNITY HOPS, ETC.

CLEARANCE SALE

of Pennants and Cushions

Closing out our entire stock of Felt
Goods. Prices cut in two.

Kiler-Walters Drug Co.

Eleventh Ave. and High St.

MARZETTI

Restaurant

1548 N. HIGH ST.

Headquarters for "Ohio State" Boys.

STRICTLY HOME COOKING.

FAMOUS PORK SANDWICH.

POOL.

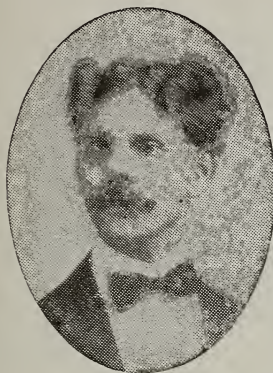
Maddox & Kilgore

AGRICULTURAL DRAWING INSTRUMENTS AND MATERIALS
HIGH ST., OPP. ELEVENTH AVE.

Please mention THE AGRICULTURAL STUDENT when writing advertisers.

The Euclid Academy of Dancing

COR. HIGH ST. and EUCLID AVE. Five Minutes' Walk from Ohio State
Weekly Reception, Every Thursday Evening.



Beginners' Class Friday Evenings

TUITION.

Gentlemen, per term of ten lessons.....	\$4 00
Ladies, per term of ten lessons.....	3 00
Private lessons	1 00
Gentlemen, per term of seven lessons.....	5 00
Ladies, per term of six lessons.....	4 00

Private lessons can be had any hour—morning, afternoon or evening. We guarantee to teach you to dance in one term of private or class lessons. Academy has been newly decorated throughout, which makes it more suitable than ever, and can be secured for private parties, fraternity hops, etc.

Prof. H. J. Guerr. Business & Residence Phones: Auto 8584; Bell N. 1759

The Randall Orchestra

"Ball-Room Experts"

Bell Phone, North 1487

Director, H. Kurtz Randall.

35 CHITTENDEN AVE

ORR-KIEFER



COLVMBVS.O.

Orr-Kiefer Studio Co.

199-201 SOUTH HIGH STREET

Artistic Photography

"Just a little better than the best"
SPECIAL RATES TO STUDENTS

We Frame Pictures of all kinds—RIGHT

John Hancock
 MUTUAL

Life Insurance Company

of Boston, Massachusetts

J. C. CAMPBELL, State Agent for Ohio and West Virginia
 Hartman Building, Columbus, Ohio.

Total payment to policy-holders during the 50 years' experience,
 over \$175,000,000.

Payment to policy-holders during 1911, represents an average of
 over **Thirty-one Thousand Dollars** for each working day in the year.

For further information, address

W. E. & R. W. HOYER,
HARTMAN BUILDING, COLUMBUS, OHIO.
 Citizens Phone 2853 Bell, Main 1390

The College Book Store

Agricultural Books, New and Second Hand

Get The Best

Special to all Students at Ohio State: The New Student Folder
 only \$3.50 per dozen. A photo of the best style and strictly up to date.

Baker Art Gallery
 COLUMBUS, O.

THE OLD RELIABLE, STATE & HIGH STS.

Clothes may not make the man, but they help a lot to establish him

*We make the kind of Clothes that make a man feel
right. The Clothes wear right and Satisfy because
our "kind" of Tailoring makes it possible . . .*

The "So-Different" Tailory

C. H. BRADLEY, Prop.

Citizens Phone 5395

High Street at Tenth Avenue

Jack Earl

Ben Williams

MEET ME AT THE

Varsity Barber Shop Cigar Stand and Pool Room

The Students' Rallying Place

1585 NORTH HIGH ST., Opp. E. 11th Ave.

Phone, North 59.

LOUIS MONHIET

Merchant Tailor

Suits Made to Order from \$18.50 to \$35.
All Kinds of Cleaning, Pressing and Repairing
1168 North High Street

Brosmer's Ice Cream Parlor

The Place to Take Your Friends.

We Do Catering.

HIGH ST. OPPOSITE 11TH AVE.

Neat Dress is the Signature of Prosperity. Let

S. BLOOM

The Tailor

fit you with a fall suit and overcoat.

682 N. HIGH ST.

Bell, Main 599

The Columbus Blank Book Mfg. Co.

Stationers and Office Outfitters

DESKS, FILING DEVICES, BOTH WOOD
AND STEEL

PRINTERS, BINDERS, ENGRAVERS

317-319-321 SOUTH HIGH ST., Columbus, O.

Both Phones:

Citizens 2219

Bell, Main 219

EVERYTHING IN STATIONERY AND
BLANK BOOK LINE.

NO BETTER CLOTHES THAN
MENDEL'S
 —AT ANY PRICE—

Suits made and guaranteed to fit, from
 \$18 to \$40

MENDEL, The Tailor
 545 N. HIGH ST.
 Few Doors South of Goodale St.

H. B. Roberts
THE TAILOR

We do Cleaning, Pressing and
 Repairing

221 WEST EIGHTH AVENUE

Dry Cleaning -- Pressing



1534 NORTH HIGH, AT NINTH AVE.

The "Velvet" finish on "Collars" allows the "Tie" to "Slip Easy."

**The McDonald
 Hardware Co.**

FIFTH AVE. AND HIGH ST.

We are always pleased to do business
 with O. S. U. boys.

FRATERNITIES AND BOARDING CLUBS
 Always Find Our

**Meats and
 Groceries..**

STRICTLY FIRST CLASS
ABERNATHY BROS.
 1609 HIGHLAND STREET
 Citiz. Phone 16504 Bell, North 857

BLACKWOOD, GREEN & CO.

Hardware

Stoves and House Furnishing Goods
 Slate and Metal Roofing

624 NORTH HIGH STREET
 COLUMBUS, OHIO

Subscribe for
 The Agricultural Student,
 the greatest
 college monthly published.
 You cannot afford to
 be without it.

Prominent Live Stock Breeders

These men solicit your trade. They have a reputation for honesty and square dealing and we recommend them to be reliable and safe. Mention "THE STUDENT" when you write.



Shropshire Sheep

Bred By

W. F. Palmer & Son
PATASKALA, OHIO.

We have some extra good home bred yearling rams and ewes bred to Imported Tanner or Buttar rams which we will offer at reasonable prices for fall delivery. Come and look over our flock, on Newark Traction line, near Wagram Stop.



Broad Head, 1220—First at Columbus, 1909.

Grass Lick Stock Farm

Breeders and Exhibitors of

Amer. Merino and Delaine Sheep

This flock showed at "thirteen" leading "State" and County Fairs in 1911, won 151 Firsts, 119 Seconds and 19 Flock and Champion prizes. Ewes and Rams for sale.

J. J. DEEDS & SON

PATASKALA, OHIO.

Newark Traction Line, Stop Moore's Corners.
Call up Mr. Schoeff.

Good Young Boars



We have for sale a few young boars of last spring's farrow, ready for service. This is an excellent opportunity to secure good herd boars at a reasonable price.

Write at Once To

WM.H.ROBBINS. SPRINGFIELD OHIO.



PURE BRED REGISTERED HOLSTEIN CATTLE

The most profitable dairy breed, greatest in size, milk, butter fat, and in vitality.

Send for FREE Illustrated Descriptive Booklets

Holstein-Friesian Asso., F. L. Houghton,
Sec'y, Box 154, Brattleboro, Vt.

Lake View Farm

Hull Bros., Props.,

PAINESVILLE, OHIO.

Brown Swiss Cattle

Please mention THE AGRICULTURAL STUDENT when writing advertisers.

**I'll Feed Your Stock
60 Days
Before You
Pay**

**I'll Show
You How**

**To make them grow faster—thrive better—look better—
Put on flesh on no more feed—stop losses from worms—**

I have done it for thousands of farmers and stockmen—I'll do it for you. All I ask is the privilege of sending you enough Sal-Vet to last your stock 60 days. I simply want to show you what a remarkable change Sal-Vet will work on your sheep, your hogs, your horses and cattle. I want to show you how it will improve their condition—rid them of all stomach and free intestinal worms which are the biggest drain on your stock profits. I don't ask a penny of pay in advance. I prove all my claims first—and if you are not satisfied at the end of 60 days, you do not pay me a cent.

**The Great SAL-VET and Stock
Worm Destroyer and Stock
Conditioner**

Sal-Vet is first a worm destroyer; second, a conditioner; a medicated salt. It contains several medicinal elements which promptly kill and expel stomach and free intestinal worms and in the meantime puts the digestive organs in a healthy, vigorous condition. It sharpens the appetite—tones the blood—puts life and vitality into the whole system. It aids digestion—helps the animal to derive more good from its feed.

No Drenching—No Handling—They Doctor Themselves

It is easy to feed Sal-Vet—you feed it just as you do salt. Put it where all your stock—sheep, lambs, hogs, horses and cattle, can get at it daily and they will doctor themselves. It will keep your hogs, sheep and lambs from dying—make your horses and cattle look better, thrive better—save you money in saving feed—make you more profit by making your stock more valuable. I want to prove all this on your own farm and before you pay me one cent. You cannot afford not to accept this open, liberal offer. You pay the small freight charge when it arrives and I will send you enough Sal-Vet to feed your stock 60 days, after that you pay if pleased. Read this letter:

From Sec'y Amer. Hampshire Swine Record Ass'n.

"I write to say that I have been a free user of Sal-Vet ever since its introduction and find that it is a perfect worm exterminator. I feed Sal-Vet as I would salt and it positively does all that you claim for it. There is nothing within my knowledge as good and reliable or as cheap. It expels worms and puts stock in better condition." L. C. STONE, Peoria, Ill.

Send No Money—Simply Send Coupon

If you could open and read the letters I get, voicing the appreciation of hundreds of stockmen and farmers—who have taken advantage of my liberal offer, you would not delay a minute in sending me the coupon requesting enough Sal-Vet to feed your stock 60 days, especially when I do it before you pay. Now fill in the coupon, telling how many head of stock you are feeding—mail at once. Sal-Vet costs but one-twelfth of a cent per day for each hog or sheep.

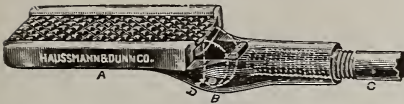
SIDNEY R. FEIL, President
THE S. R. FEIL CO., Dept. A-5, Cleveland, O.
Prices: 40 lbs., \$2.25; 100 lbs., \$5.00; 200 lbs., \$9.00; 300 lbs., \$13.00; 500 lbs., \$21.12. No order filled for less than 40 lbs.

SIDNEY R. FEIL, Pres. THE S. R. FEIL CO., Cleveland, Ohio
Ship me enough SAL-VET to last my stock 60 days. I will pay for the freight charges when it arrives, report results in 60 days and will then pay for it. If it does not, you are to cancel the order.

Name _____ P. O. _____
Shipping Sta. _____
State _____ Sheep _____ Hogs _____
Cattle _____
A-5 3-13

Please mention THE AGRICULTURAL STUDENT when writing advertisers.

WE LEAD THE WORLD IN

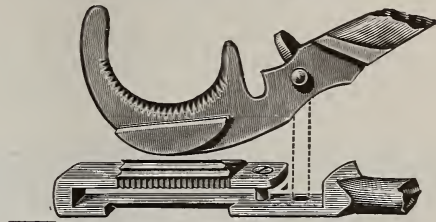
VETERINARY INSTRUMENTS**DUNN'S "LOCK" FLOATS**

(Patent Applied For.)

**ABSOLUTELY PERFECT—A MARVEL OF
SIMPLICITY AND DURABILITY.****Points of Superiority**

Has no screws. Will hold a long or short Blade.
Easily cleaned. No parts to rust.
Requires No Special Blades.

824 Straight Float	\$2 50
825 Angular Float	2 50
826 Black Molar Float	2 50
827 Concave (spoon) Float	2 50
Set of 4 with 2 handles	9 00
Write for Special Circular of Dunn's Perfected Mouth Speculum.	

DUNN'S "ASEPTIC" EMASCULATOR

(Patent Applied For.)

(Figure 1760.)

A modification of the Dr. Geo. R. White-Haussmann Emasculator. This instrument is essentially the same as the White-Haussmann Emasculator, but considerably improved by being made aseptic as shown in the illustration. This instrument and the White modification should not be confused with other so-called White Emasculators, as they are materially different in construction. The emasculators manufactured by us. Price, \$10.

SPECIAL PRICES TO STUDENTS—Send list of wants. We will not be undersold.

HAUSSMANN & DUNN CO.**VETERINARY INSTRUMENTS**

708 SOUTH CLARK ST.

TEXT BOOKS AND SUPPLIES

CHICAGO, ILLINOIS

Write for Catalogue and Special Prices for Cash

Choice Pure Bred Live Stock

is bred by the Animal Husbandry Department of the

Ohio State University

We breed Percherons, Clydesdales, Hackneys, Shorthorns, Jerseys, Holstein-Friesians, Guernseys, Shropshires, Merinoes, Berkshires, Duroc-Jerseys, Large Yorkshires and some other. We often have surplus stock for sale at a reasonable price.

Address, **DEPARTMENT OF ANIMAL HUSBANDRY,**

Ohio State University, Columbus, Ohio.

Polled Herefords

Nothing gone but the horns.

Hampshires

The Coming Breed.

Ashland Stock Farm

Write for Information to

E. Field & Son Camden, Ohio

Minor's Fluid

A GUARANTEED

Sheep and Hog Dip

If your dealer will not supply you,
write us direct.

The W. E. Minor Disinfectant Co.

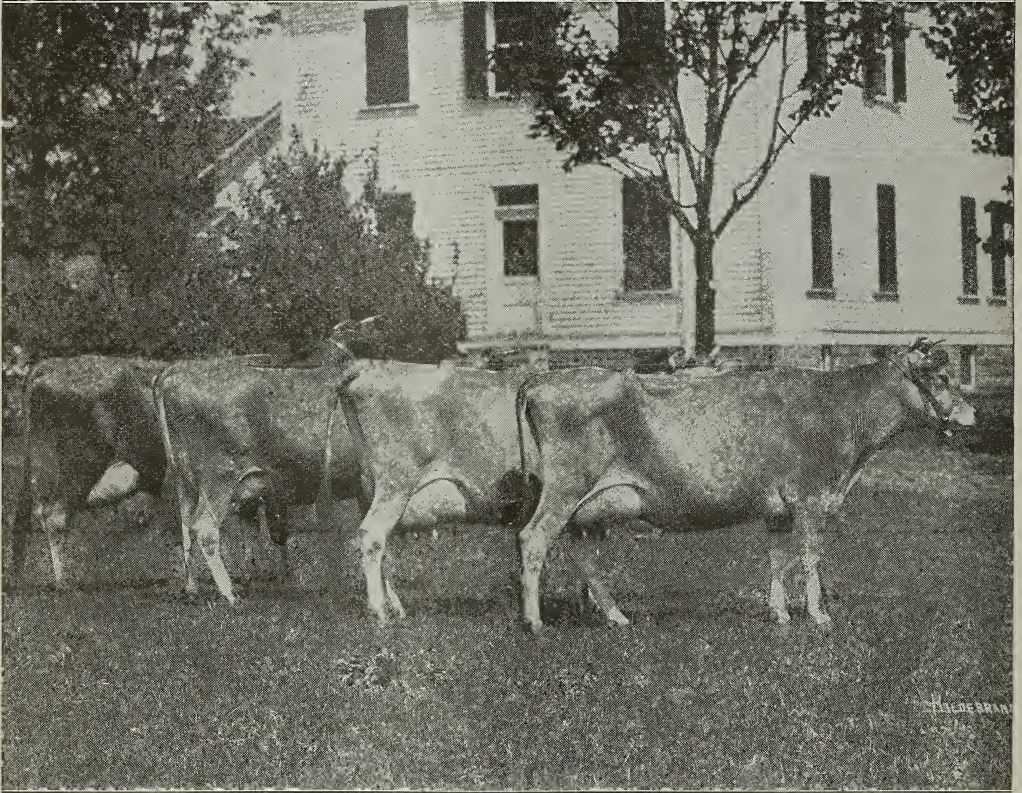
1519 Columbus, Rd., CLEVELAND, O.

Please mention THE AGRICULTURAL STUDENT when writing advertisers.

The Hartman Stock Farm

OFFERS SPECIAL INDUCEMENTS

To those starting in the Jersey Cattle or Poultry business by selling the very best of Breeding and Individuality at Reasonable Prices.



FOUR DAUGHTERS OF LUCY'S CHAMPION (IMPORTED) 79315

Over Five Hundred Head, All Tuberculin Tested

OUR HERD IS HEADED BY

LUCY'S CHAMPION 79315

His Daughters combine both Beauty and Utility

THE HARTMAN STOCK FARM

White-Stock Farm

CHEVIOT
AND SHROPSHIRE SHEEP
FOR SALE

R. & W. POSTLE, STOP 7, O. E. Ry.
Camp Chase, O.

Lagonda View Farm

Edward H. Mickle, Prop.,
Springfield, Ohio

Durocs - Rambouillets - Jerseys

FOR SALE—Yearling Boars sired by Good E Nuff Again, 24,875, "The Duroc Wonder;" Spring Lambs, sired by the State Champion, Hyperion.

"LIKE BEGETS LIKE"

THE SHEPHERD'S

If you want to buy, sell, or learn how to properly care for sheep or goats you need this beautiful publication; the best in the world. Only fifty cents a year. Free sample copy to those mentioning this paper. Agents wanted. Address 310 Monadnock Building, Chicago, Ill.

JOURNAL.

Pentolia Stock Farm

G. A. Dix, Successor to C. D. F. Dix & Son
DELAWARE, OHIO

Breeders of

**Registered Percherons,
Berkshires and Shropshires**

Young Stock For Sale

Prices Reasonable, Breeding and Quality Considered

SHEPARD & OSBUN

COLUMBUS, O.

— Breeders of —

Poland China Hogs

We have the greatest Boars of the breed—SENTINEL and WHIRLWIND. Both sires of Grand Champions. Stock for sale at all seasons.

Visitors Welcome.

Polled Jersey Cattle

Rich milking, hornless beauties. Pleasant to work with. Profitable to own. For names of breeders, etc., write

CHAS. S. HATFIELD, Sec'y,

R. D. 4, Box 30.

Springfield, O.



Butter Profits

You ought to get more butter profits. Jersey Cattle mean more butter profits because they yield more butter fat at less net cost of keep than any other breed.

THE JERSEY

excels in beauty of dairy type. She is a persistent milker. Jerseys are easily acclimated. They live long and keep healthy. They mean steady butter profits. Write now for Jersey facts. Free for the asking.

American Jersey Cattle Club
324 W. 23d Street, New York

America's Leading Horse Importers



The Best Percheron and Coach Stallions
THAT COME FROM FRANCE.

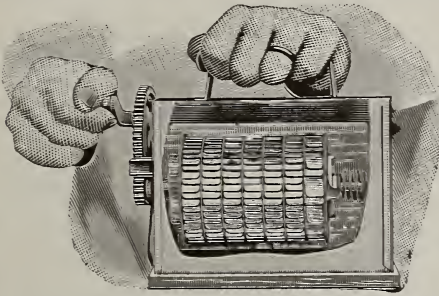
These horses are all for sale at lower prices than equal merit can be bought elsewhere.

McLaughlin Bros.
COLUMBUS, OHIO.

REVOLUTION

The U. S. Mechanical Washer is Revolutionizing the System of Cleaning Cream Separator Bowls.

THE UNITED STATES CREAM SEPARATOR is best adapted for mechanical washing, owing to the arrangement of the skimming sections which drive the washing water with tremendous force through the skimming device, actually scrubbing all parts of the metal. There are no obstructions to retard the water or to hold the milk and dirt.



No separator equals the **U. S.** for quick, easy washing. Try this Washer in your dairy school and see for yourself.

VERMONT FARM MACHINE CO.

BELLOWS FALLS, VT.

CHICAGO ILLINOIS.

Successful Buttermaking

Depends Upon
the Quality of Material Used

HERE IS THE PROOF

Highest Ave. Score, Whole Milk Class,
Ia. 10 Mo. Edu. Butter Contest
Won by

1st—Erve Cole, Lamont, Ia., Score 96½.
1st—P. Peterson, Pinchford. Score 96½.
Using Chr. Hansen's Butter Color.

Hand Sep. Class, 10 Mo. Ave.

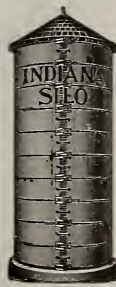
1st—Henry Hansen, Cylinder, Score
95.56, using Chr. Hansen's Lactic
Ferment Culture.

'TIS PROVEN! QUALITY COUNTS!
Order these Quality Producers Now

Chr. Hansen's Laboratory
LITTLE FALLS, N. Y.

FARMING WITHOUT AN

INDIANA SILO



is like carrying milk in a
leaky bucket.

The Indiana Silo pre-
serves all your crop and
stops the leaks that drain
your bank account. Puts
fat on your stock, milk in
your pails, money in your
bank. You can buy an In-
diana Silo, and never miss
the money.

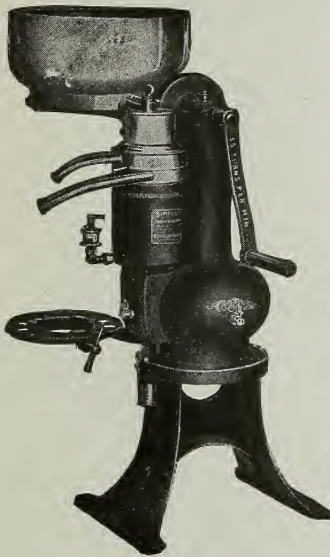
WRITE FOR BOOKLET
Address Nearest Office

Indiana Silo Co.

Anderson, Ind., 78 Union Bldg.
Des Moines, Ia., 78 Indiana Bldg.
Kansas City, Mo., 78 Silo Bldg.

The "SIMPLEX" Link Blade Cream Separator

Improved Design



LIGHTEST RUNNING.

LARGEST CAPACITIES.

CLOSEST SKIMMING.

The Only Practical Large Capacity Separator

500 lbs. \$75.00 900 lbs. \$ 90.00

700 lbs. 80.00 1100 lbs. 100.00

D. H. BURRELL & CO.

LITTLE FALLS, N. Y.

Manufacturers of Creamery, Cheese Factory
and Dairy Apparatus and Supplies.

Also, B-I-K COW MILKING MACHINES.

Cottonseed Meal DIXIE BRAND

For QUALITY and SERVICE write direct to

HUMPHREYS-GODWIN CO., Memphis, Tenn.

Dairymen Who Ship Their Cream

to us will tell you that they receive greater benefits and more advantageous arrangements than elsewhere. Why not try us and prove it. A postal brings Booklet. ∴

The West Jefferson Creamery Co.
COLUMBUS, OHIO

Please mention THE AGRICULTURAL STUDENT when writing advertisers.

The Bigness of Little Things

The typhoid fever germ is microscopic in dimensions, but unless treated with the typhoid serum is mighty in the results it is able to accomplish.

With equally humble origin and unpretentious size the bacteria of unclean milk reduce its market value as well as the market value of the butter or cheese into which such milk is manufactured.

To insure against such injury by removing bacteria as well as all other objectionable matter as far as is possible to be done by physical and mechanical means is the work of

Indian In Circle



In Every Package

Wyandotte
Dairyman's
Cleaner and Cleanser

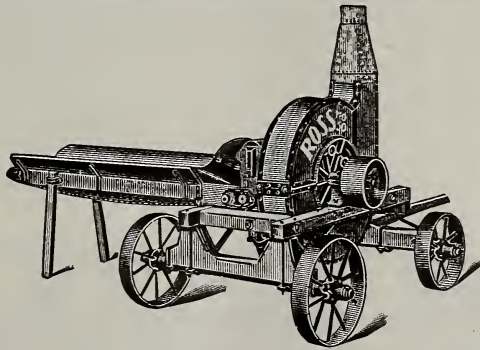
How well it does this work is not a matter of hearsay, but one upon which abundant proof of an authoritative as well as a practical nature is easily obtainable. Or what is better, ask your dairy supply man to send you a barrel or keg of Wyandotte. Try it for yourself; if not all we say, the trial will cost you nothing.

THE J. B. FORD CO., Sole Mfrs, WYANDOTTE, MICH., U. S. A.

This Cleaner has been awarded the highest prize wherever exhibited.

**ROSS
STAVE
SILOS**

With
Hinged Door



**ROSS
SILO
FILLING
MACHINERY**
With Blower

We are ENGINEERS in the line of equipping Farms with the modern method of FEEDING SYSTEM.

WE do business on the basis of GOOD QUALITY giving GOOD SATISFACTION.

To all those interested we say, find out what the ROSS SILOS and Machinery means to you. We invite detailed correspondence.

Manufactured by

THE E. W. ROSS CO., Springfield, O.

Established 1850—63 Years of Experience.



Agricultural Colleges and Experimental Stations Look To Us For Seed Indigenous To This Territory

We have the best that money and experience can produce. Our complete catalogue of Seeds and Farm Requisites will be mailed upon request.

The J. M. McCullough's Sons Co.
SEEDSMEN

Established 1838

316 WALNUT STREET, CINCINNATI, OHIO.

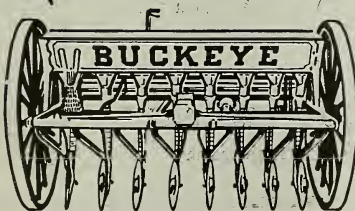
TREES

Get Them From . . . **BARNES' NURSERIES**
COLLEGE HILL, CINCINNATI, OHIO

A big stock of 1-year Apple, 2-year Jonathan Apple, Sour Cherry, and all General Nursery Stock. Write us.

BUCKEYE GRAIN DRILLS

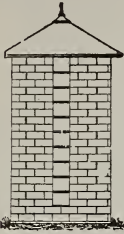
*"The Buckeye-
a wise buy."*



BUCKEYE DRILLS have many exclusive features to be had on no other Drill—features that mean much to the farmer. It is the only drill having the fertilizer hopper lined with galvanized metal; the only drill with a glass cone fertilizer feed. The Buckeye is the only drill that has a nested cone gear driver. The Buckeye is the drill with an absolute force feed that will sow all seeds accurately and put them in the ground at an even depth. Made in all styles and sizes. Go to your local dealer and insist on seeing the Buckeye Drill. Send for catalog.

The American Seeding Machine Co.
INCORPORATED
Springfield, Ohio, U.S.A.

LIKE THE "ROCK OF GIBRALTAR"



—"without a crack anywhere and keeping the ensilage perfectly, right up to the edge all around"—this is the statement of Mr. W. R. Spann, of Shelbyville's famous "Burr Oak" Farms, while speaking of his

Perfect Reinforced Cement Silos

Storms, wind and weather cannot destroy "Perfect" Silos. Made of everlasting cement blocks, reinforced with wire and steel rods. Absolutely fireproof. Guaranteed not to crack. Write for illustrated, descriptive booklet giving the opinions of leading farmers and dairymen.

REPRESENTATIVES WANTED Write for terms and free booklet.

The PERFECT REINFORCED CEMENT SILO & CISTERN CO.
DELAWARE, OHIO.

General Sales Agents, Hocking Valley Ensilage Cutters.

OUR SPECIALTIES

Caloric Noiseless Pumping Engines, Individual Water Works Systems, Hot Air and Hot Water Heating Systems, Low Voltage Electric Lighting and Power Plants for the Farm and Home.

Interurban Electric and Machine Company

"Modernizers of Country Homes"

Office and Demonstrating Rooms, 1547-49 **NORTH HIGH ST., COLUMBUS, OHIO.**
Bell Phone, North 3489.

We want your wants. We have what you want. Write us just what you want and we will save you money. We ask you for no settlement until your purchase has proven its worth. Could you ask more?

When in need of Surgical or Veterinary Instruments or Hospital Supplies, etc., do not forget we carry a full and complete up-to-date line. Catalogs sent **FREE, POSTPAID, UPON REQUEST.**

SHARP & SMITH

Manufacturers and Importers of

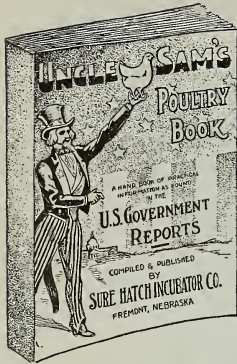
**High Grade Surgical and Veterinary
Instruments and Hospital Supplies**

103 NORTH WABASH AVE., CHICAGO, ILL.

2 Doors North of Washington St.

Established 1844.

Incorporated 1904.



HOW TO SUCCEED WITH CHICKENS

is plainly and completely told in

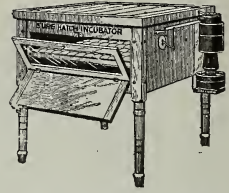
UNCLE SAM'S POULTRY BOOK

A complete guide to poultry culture written by government experts. Worth \$10.00 to you and sold for only 20 cents, and by our plan you can get 50 cents back. Send 10 2-cent stamps or 2 dimes today for it. You can get it only from us. Uncle Sam says to use an incubator to get the most satisfactory results and

THE SURE HATCH INCUBATOR

is the only one built as he says an incubator should be made. Heavy, strong, of best material and modern features not found in any other machine. Complete control of heat. Hatches Chicks that Live, 60 days' free trial, guaranteed five years. Freight Paid. Big catalogue free. Send for it today and get your chicks onto the high-priced market as soon as possible. Chickens and eggs are going to be higher this winter than you have known them.

SURE HATCH INCUBATOR CO.,



Drawer B, Fremont, Nebr.



SPRAY
THOROUGHLY

Grasselli Arsenate of Lead Paste Grasselli Lime Sulphur Solution

Recognized as Standard by Leading Fruit Growers

Why Use Any But the Best?

or sale by Dealers Everywhere. Correspondence Solicited

THE GRASSELLI CHEMICAL CO. The Arcade,
Cleveland, O.

Established 1839

Feeds and Feeding

By PROF. W. A. HENRY

The standard work on feeding
live stock.

Regular Price

Feeds and Feeding (retail) \$2.25

Agricultural Student (year) 1.00

Total, - \$3.25

Combination Offer, both - \$2.50

This offer does not apply to students of Ohio Agricultural College.

FOR MAXIMUM RESULTS SPRING FERTILIZERS

must be composed of readily available plant food materials.

Soil Bacteria are not very active in the spring while the ground is still cold. Farmers' complete brands supply soluble PHOSPHORUS, POTASSIUM and NITROGEN and nourish the young plant until the ground becomes warm enough for the nitrifying bacteria to become active.

The use of FARMERS' BRANDS guarantee availability and field results and is an insurance on your crops.

Special attention given to inquiries of the Ohio State Students and Alumni.

**THE
FARMERS FERTILIZER
COMPANY**

COLUMBUS OHIO

C. B. Young, Manager, Class 1905.



Feed Your Crops Available Potash

Insoluble plant foods are cheap in the beginning but may be dear in the end. We feel good when we hear that the soil contains enough Potash to raise 5000 crops, but we feel tired when we discover that it will take 1000 years or so to make it available. We will be converted into plant food ourselves long before that.

POTASH

The acids derived from green manure may make insoluble phosphate of lime more available. But the feldspathic Potash in the soil is less soluble in these acids than in the slightly alkaline waters of the best soils. A little soil Potash becomes available yearly, but not enough to provide for profitable crops. Crops have two periods of Potash hunger. One just after germination and the other when starch formation is most rapid—when the grain is filling. Rational fertilization requires ample available Potash at these periods and if you provide it you will find that **Potash Pays.** Send for our pamphlet on making fertilizers.

German Kali Works, Inc., 42 Broadway, New York

Monadnock Block, Chicago, Ill.

Bank & Trust Bldg., Savannah, Ga.

Whitney Bank Bldg., New Orleans, La.

Empire Bldg., Atlanta, Ga.

SUPERIOR

GRAIN DRILLS

"The Name Tells a True Story."

Superior Drills are used in every grain growing country on earth wherever grain is grown."

"The Superior feed sows every seed."

Superior Drills are made in every style and in all sizes, from one horse up.

It makes no difference what your seeding conditions are, you can rely on the Superior to do that work as it should be done. Superior Drills are sold under a warranty that absolutely protects the purchaser. Send for the Superior Catalogue. Read it carefully and then go to your local dealer and insist on seeing the Superior Drill.

THE AMERICAN SEEDING MACHINE CO. INCORPORATED
SPRINGFIELD, OHIO, U.S.A.

BEES FOR THE FARM

Need little attention and pay big profits. If you are interested in them send for a sample copy of *Gleanings in Bee Culture*. Also a bee supply catalog.

THE A. I. ROOT CO.,
 Box 391, Medina, Ohio.

Every Breeder & Feeder
 should possess a copy of
Henry's Feeds and Feeding

Please mention THE AGRICULTURAL STUDENT when writing advertisers.



GROUND PHOSPHATE ROCK



“PRAIRIE STATE” MEANS QUALITY

Our business is **exclusively** the production of ground Phosphate Rock.

We are **not** manufacturers of Chemical Fertilizers, with a “ground rock branch, or department.”

Our high grade rock is **not** sorted out.

The entire output of our mines goes direct to the consumer.

We deliver the absolute maximum of quality, at the lowest price you can **afford** to pay.

Buy it by the POUND of PHOSPHORUS; not by the ton of material.

QUALITY, NOT PRICE IS ECONOMY.

PRAIRIE STATE PHOSPHATE CO.

(The Natural Phosphate Co.)

Monadnock Block, CHICAGO, ILLINOIS.

Dollars From Sense

A little "Horse Sense" as applied to Colts and Corn.

Would you take the trouble to breed a fine colt and then turn him out to hustle for his food? You wouldn't raise very much of a colt.

Your Corn, like a young colt, needs proper food from the very start and through all the growing period to make the best of its ancestry.

The most economical and profitable way of supplying food to corn is by using

Armour's Fertilizers

These goods are made from Bone, Blood and Tankage from the great Armour meat packing plants, together with the highest grade Acid Phosphate and imported Potash Salts; finely ground, thoroughly cured and in best drilling condition. They are quick in starting and lasting in effect.

SPECIAL MIXTURES FOR ALL TYPES OF SOILS.

DOUBLE THE YIELD

IMPROVE THE QUALITY

HASTEN MATURITY

AND

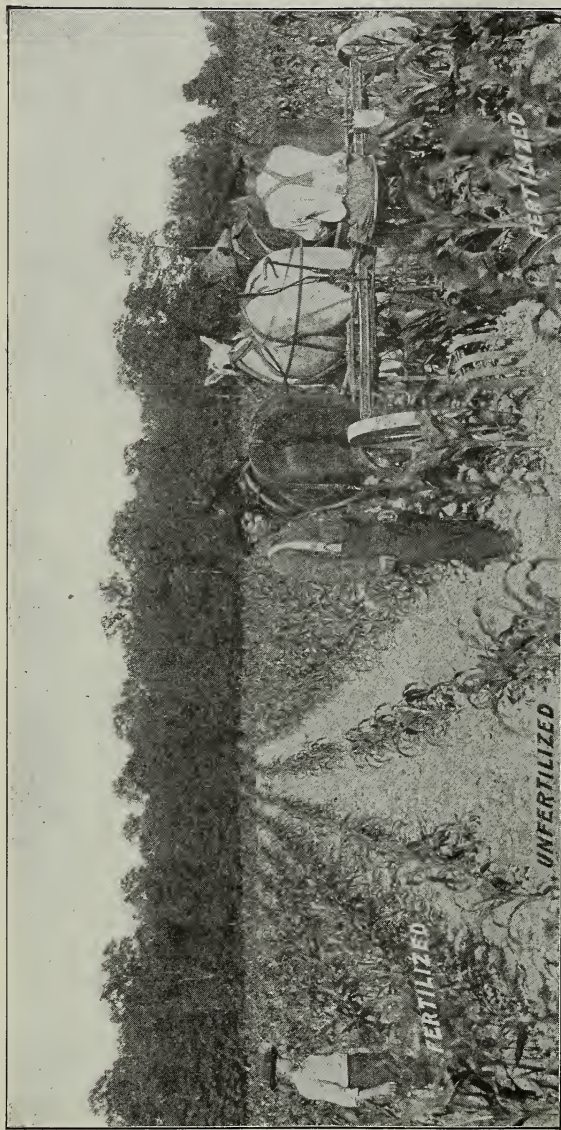
INCREASE YOUR PROFITS

GET THE BEST RESULTS FROM YOUR WORK!

Write for our handy pocket memorandum book and Armour's Farmer Almanac for 1913, also name of nearest agent.

Armour Fertilizer Works

Union Stock Yards, Chicago



This progressive young farmer makes money by using Jarecki Fertilizer under his corn and saves money with his double row cultivator.

We have been manufacturing Fertilizers for thirty-one years. Where our goods have been introduced there is a steadily increasing demand and the dealer to whom we shipped the first car of fertilizers produced by us back in 1881 is today still selling the same in increasing quantities. Our business is conducted on scientific lines by experienced and trained men who have grown up in the industry and know the actual wants of the farmer and how to supply them most economically. Our factories, located at Cincinnati and Sandusky, Ohio, are models of their kind and the location of the same gives us unsurpassed manufacturing and shipping facilities.

Ask us to send you our special circular with suggestions as to how you can

Double Your Corn Crop

THE JARECKI CHEMICAL CO., Cincinnati and Sandusky, Ohio

BE PROGRESSIVE

—BUY—

HIGH GRADE COMMERCIAL FERTILIZERS

The absolute "Measure of Value" of Acid or Rock Phosphate is the **cost per unit** of available phosphoric acid.

We manufacture and sell eleven brands of fertilizers. Our "Wheat Special" is the highest grade of acid phosphate sold in **OHIO**.

The M. Hamm Company

WASHINGTON C. H., OHIO.

OTHERS GUARANTEE

"Nature's Source of Phosphorus"

WE DELIVER

GROUND PHOSPHATE ROCK

The most economical and only permanent source of phosphorus. An application of 2000 lbs. per acre will furnish an abundant supply for five to ten years and does not sour or injure the soil.

As to the methods of applying and benefits derived from this material we refer to results reported from your own Experiment Stations and those of the University of Illinois.

We are miners and shippers of Tennessee Phosphate Rock and have been steadily engaged in the business ever since the discovery of the Mt. Pleasant deposits.

We have the most complete and "up-to-date" drying and grinding plant in Tennessee and devote our time and attention to the preparation of GROUND PHOSPHATE ROCK for direct application.

A large storage capacity enables us to make prompt shipments. We are always ready to correct and make good our mistakes and will use every endeavor to give satisfaction.

Write me for guarantees and prices.

JOHN RUHM, Jr.
MT. PLEASANT **TENNESSEE**

Ground Rock Branch of

RUHM PHOSPHATE MINING COMPANY

Miners and Shippers of Tennessee Phosphate Rock

Please mention THE AGRICULTURAL STUDENT when writing advertisers.

The Agricultural Student

Realizes perhaps more than any one else, the immense importance of supplying the soil with AVAILABLE plant food and the very much lesser importance of supplying it with an additional quantity of unavailable plant food, such as rock phosphates, etc., of which it already has an ample supply. The key to the situation, the means of producing large crops without depleting the soil, lies in the use of AVAILABLE plant food and complete fertilizers where manure, green crops and humus are not to be had in sufficient quantity.

BOWKER'S FERTILIZERS

supply available plant food in the most acceptable forms and in ample quantity for all classes of crops, whether grown in the field or the market garden.

Our booklets may interest you.

Bowker Fertilizer Works

1204 Second National Bank Building,
CINCINNATI, OHIO.

"THE HOUSE WITH FACILITIES"



COLUMBUS, OHIO.



WHEN IT'S
ILLUSTRATIONS
or **ENGRAVINGS**

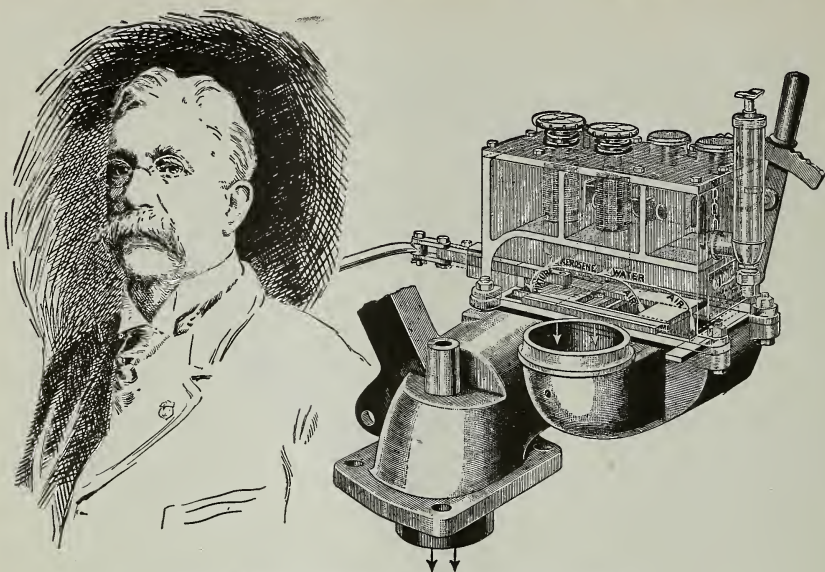
*of any kind
see or write*

Bucher Engraving Co.

80½ N. High St., Columbus, Ohio



Please mention THE AGRICULTURAL STUDENT when writing advertisers.



John A. Secor, Inventor of the Secor-Higgins Carburetor

The OilPull and Economy

Gasoline is the scarcest of all liquid fuels and the most expensive. The demand for gasoline is forcing the price higher and higher. Kerosene is abundant and cheap. Gasoline is going up—Kerosene down.

The OilPull burns kerosene—in two years it saves enough to pay for itself.

The Secor-Higgins system of carburetion made the OilPull possible. Burning kerosene cold for power had never been accomplished before. John A. Secor discovered the way to use oil without sacrificing a single desirable feature of the best gasoline engine.

The Secor-Higgins system provides an automatic variation in the quantity of fuel mixture in accordance with the slightest variation in speed or load. This enabled the OilPull to burn kerosene under all conditions. No other engine had ever been able to do this.

We shall be glad to explain in detail how it does it. Write us today.



RUMELY PRODUCTS CO.

(Incorporated)

Power-Farming Machinery

LA PORTE, IND.

229

MYERS PUMPS FOR ALL PURPOSES

Fig. 1345

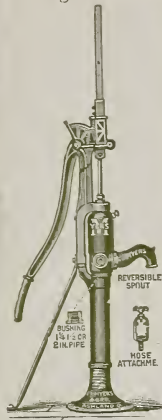


Fig. 1287

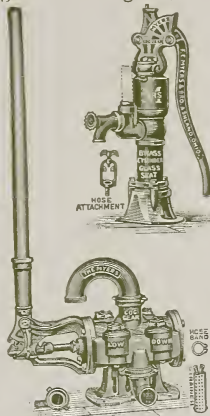


Fig. 1354

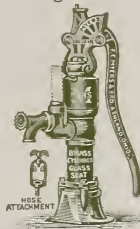


Fig. 1160

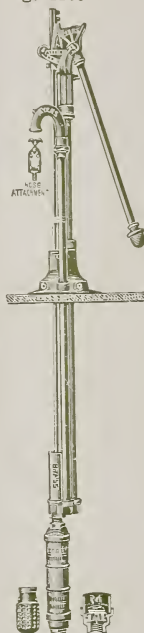


Fig. 333



Fig. 1138

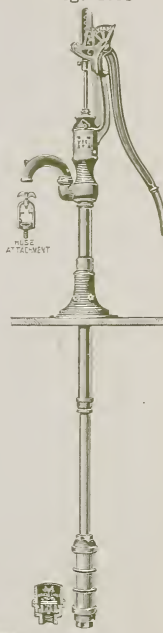


Fig. 813

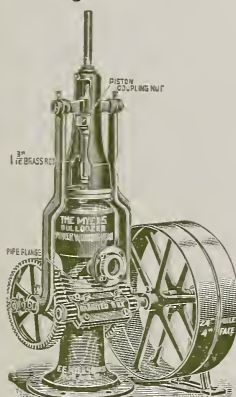
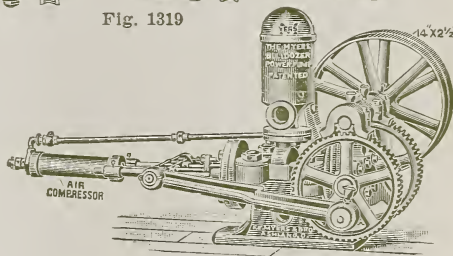


Fig. 1319



WELL PUMPS—Plain or Ratchet Handle, Single and Double Acting Force or Lift, Hand or Windmill.

HOUSE AND CISTERN PUMPS—Plain or Ratchet Handle, Single or Double Acting, Force or Lift.

PUMP STANDS—Plain or Ratchet Handle, Force or Lift, Hand or Windmill. For Tubular or Other Wells.

HYDRO-PNEUMATIC AIR PUMPS—Hand or Power, used in connection with Pressure Tanks for Private Waterworks Systems.

POWER PUMPS—Bulldozer Power Pumps, Working Heads, Pumping Jacks, Etc., for gas engine or motor. Large or

small capacity—320 to 7200 gallons per hour.

TANK PUMPS—Plain or Ratchet Handle for Hand use, or Back Geared for Gasoline Engine when desired.

SPRAY PUMPS—Bucket, Barrel and Knapsack for hand use. Large capacity Power Sprayers for Gasoline Engines. Nozzles, Hose, Fixtures, Etc.

CYLINDERS—Brass or Brass Lined with Non-Corrosive Glass Valve Seat. Power Working Barrels, Etc.

We are also headquarters for the famous Myers' Hay Unloading Tools, Myers' Stayon Door Hangers, Etc.

Ask your dealer or write to us for circulars.

F. E. MYERS & BRO., Ashland, Ohio

Ashland Pump and Hay Tool Works.

DE LAVAL

CREAM SEPARATORS

MERIT CONFIDENCE

Confidence is one of the most important and satisfactory considerations in every act and interest in life.

There is nothing the dairy farmer buys that is of as great importance to him as the cream separator, which SAVES or LOSES money in quantity and quality of product every time he puts milk through it, TWICE A DAY 365 DAYS IN THE YEAR, and lasts from six months to twenty years according to the durability of the machine.



Hence the importance of only making so serious an investment with COMPLETE CONFIDENCE that you are buying THE BEST and that which will LAST LONGEST.

Every man who knows what a cream separator is knows that this is true of the DE LAVAL, the original and for thirty years the "WORLD'S STANDARD" cream separator. Somebody may CLAIM as much for some other separator, but no buyer can possibly have equal CONFIDENCE in its being so.

The new 72-page De Laval Dairy Hand Book, in which important dairy questions are ably discussed by the best authorities, is a book that every cow owner should have. Mailed free upon request if you mention this paper. New 1913 De Laval catalog also mailed upon request. Write to nearest office.

THE DE LAVAL SEPARATOR CO.

NEW YORK

CHICAGO

SAN FRANCISCO

SEATTLE